

1988 PRINCE WILLIAM SOUND ANNUAL STAFF MEETING NOTES  
February 17-19, 1988  
Anchorage Regional Office

Prepared by:  
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Alaska Department of Fish and Game  
Division of Commercial Fisheries  
Cordova, Alaska

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<sup>1</sup>Contribution 88-3 in The Prince William Sound Area Data Report Series. The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished Divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.

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ASSIGNMENTS

Doug Eggars

1. Have Hal put together a technical group to examine the problem concerning the number of CWT tags that need to be deployed and recovered to yield desired data.
2. Define CWT program goals.
3. Reevaluate if enhancement facilities are cost effective.
4. Talk to Phil Rigby about identifying template type reports (e.g. C&E Reports, Stock ID Reports,...) in order to speed up the review process on these types of reports.
5. Talk to the Regional Directors to get approval to include annual staff meeting summary notes in the Regional Information Report series.
6. Have Bob look at the time needed to review all reports received from the Central Region in 1987. Evaluate how long the reviewers took to complete the process. Sam Sharr reports that he currently has three reports (1985 C&E Report, 1986 C&E Report, and 1984 Stock ID Report) that seemed to have bogged down in the review process in Juneau and have not yet been returned.
7. In the next SPRC meeting initiate a review process for annual management reports and summary reports. How often should summary reports be produced (i.e. every 3 years, every 5 years,...)?

Fritz Funk

1. Talk with Doug Eggers about launching hydroacoustic surveys of the fall food/bait herring fishery at Knowles Head in Prince William Sound. Coordinate this study with the R/V Montague's vessel schedule.
2. Continue pursuing further applications of cohort analysis for PWS herring.
3. Consult with Mike Thompson about new objectives for a \$25 K spawn deposition study in PWS.

Ken Florey

1. Approach the FRED Division about funding \$20 K for CWT tag deployment at Summit Lake in the spring of 1988.
2. Need to have Headquarters review and formulate a statewide herring management policy. This came up in a discussion concerning a need to have preseason forecasts for herring by area.

3. Write a memo to Parker (with information provided from Brady and Peltz) to get permission to increase the escapement goal (from a 20,000 to 30,000 range to a 30,000 to 40,000 range) for the Eshamy district this year.
4. Check on the Valdez Fisheries Development Association (VFDA) permit alterations and review their annual management plan.
5. Talk to FRED Division and the Directors about the possibility of tacking on ADF&G operating and staff costs to PNP permit programs.

Dennis Haanpaa

1. Write a letter to hire a purse seiner for the 1988 herring fishery in Prince William Sound.
2. Check on the \$200/day contract with Mike Jackson for spawn deposition studies.
3. Budget 3 weeks of Fish Tech I time for herring AWL sampling in Cordova this spring.
4. Need an Fish Tech II and a Fish Tech I PCN for Eshamy Weir. Also need operating funds in the FY88 budget for June.
5. Someone must be assigned to watch the camp gear at the Eshamy weir site from 6/28 until the crew arrives on 7/5.
6. Add the following items to the FY89 budget, \$6 K for upper Copper River aerial surveys and an additional \$2.5 K for aerial surveys in the Copper River delta.

Linda Brannian

1. Work with Gene Sandone, Sam Sharr, and Drew Crawford to produce the PWS Herring Catch and Age Report on an annual basis.

Gene Sandone

1. Complete the Herring C&E Report for PWS by June 1, 1988.
2. Work with Sam Sharr, Linda Brannian, and Drew Crawford to produce the PWS Herring Catch and Age Report on an annual basis.

James Brady

1. Look into redefining stat areas to differentiate inside and outside waters of the Copper River delta.
2. Notify the Cordova FWP office about key ADF&G staff meetings to keep them abreast of the fisheries.
3. Find out how much additional costs would be incurred by writing up the Copper River and the Bering River marker trips on the same contract.
4. Notify FWP in late July to remind them about the PWS marker trip (8/1-8/9), so that an officer can plan to come along.
5. Complete and produce the 1987 Annual Management Report before the 1988 spring Board of Fisheries meetings.

6. Consider different options to present to the Board of Fisheries regarding the gear conflict problem (purse seine vs gillnet) at Coghill. Set up work sessions with fishermen's groups and try to develop some agreed upon solutions. Present the options to the board and let them decide how to solve the problem.
7. Add Kevin Delaney's/Sport Fish/Fish Tech III (Michael Duxbury) to the emergency order call list to keep the creel census crew personnel abreast of the latest commercial fisheries announcements. This will allow them to answer questions from the public in Valdez.
8. Complete the salmon management outlook paper for CBR and PWS by March 1st.
9. Contact Evelyn Chisum and see if she can start on April 1 as the FB I for the spawn deposition study.

Sam Sharr

1. Investigate the feasibility of designing and implementing an egg diameter study to differentiate upriver vs downriver stocks in the Copper River. A good source of information is the Stikine River Salmon Egg Diameter Study by Peter Craig.
2. Complete 1985-87 Stock ID Report by herring season.
3. Complete Fry Dig Report before herring season.
4. Assist Drew Crawford with the completion of the 1987 C&E Report. Target completion prior to the start of the 1988 salmon field season.
5. Assist Gene Sandone with the completion of the Herring C&E Report. Target completion date is June 1, 1988.
6. Work with Gene Sandone, Linda Brannian, and Drew Crawford to produce the PWS Herring Catch and Age Report on an annual basis.
7. Meet with Jim Vansant and Drew Crawford and outline a means of collecting and computerizing existing oceanographic temperature data for Prince William Sound (e.g. hatchery water temperature data, UAF water temperature data, Coast Guard water temperature data, R/V Montague's log book).
8. CC Ken Florey on any and all information on use of college interns for summer field work.

Jim Vansant

1. Send Lt. Rod Mills the specifications for the hand-held marine VHF radio units.
2. Plan on doing the Bering River marker trip with the R/V Montague unless you hear differently from James.
3. Drop the VFDA management trip (6/27-6/30) from your vessel schedule and add Eshamy Weir setup (6/27-6/29).
4. Pick up the stringer support braces at Eshamy this spring and bring them back to Cordova to be slotted and ready to be shipped out with the rest of Eshamy's camp gear on 6/28.

Mike Thompson

1. Check with Joe and contact New West Fisheries about the balance of money due for ADF&G's test fish herring deliveries for 1987.
2. Complete the 1986-87 Miles Lake Report.
3. Revise the POP for the spawn deposition study. Scale the proposed budget back to \$25 K or less and revise the objectives accordingly. Consider the following in formulating new objectives for this study: prioritize spawning areas, sample major spawning areas only, and calibrate a milt-intensity index. Consult with Fritz Funk about new objectives for this study.

Drew Crawford

1. Complete the 1987 C&E Report prior to the start of the 1988 salmon field season.
2. Work with Sam Sharr, Gene Sandone, and Linda Brannian to produce the PWS Herring Catch and Age Report on an annual basis.
3. Contact Diane Caleb and ask her if she is interested in AWL sampling herring for 3 weeks in April.
4. Build an AWL sampling personnel spreadsheet for the herring season this spring. Contact local staff and anticipated visitors and get them to commit to specific days of sampling. Should these individuals get tied up on their assigned sampling day they should be prepared to provide an alternate sampler in their place.
5. After you've caught up with all of your current reporting assignments, present the CBR/PWS historical catch and age composition summary as a regional information report with one to two pages of text.

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- A. Agenda Changes - SEE ATTACHMENT 1.
- B. Attendance

Dennis Haanpaa (Chairman), Ken Florey, Chuck Meacham,  
Tim McDaniel, Linda Brannian, John Hilsinger,  
Jim Vansant, James Brady, Sam Sharr, Ken Roberson,  
Mike Thompson, Drew Crawford (Recorder)

Headquarters Staff: Doug Eggers

Fish & Wildlife Protection: Lt. Rod Mills, Officer Roy  
Vanderpool

Herring Discussion: Gene Sandone, Fritz Funk

Computer Demo: Fred Jansen

1988 Pink CWT Report: Larry Peltz

1988 Sport Fish Programs in the CBR/PWS Area: Kevin Delaney

Administrative Discussion: Wayne Prigge

I. REGIONAL REVIEW

- A. Comments from Headquarters
- B. FY88 Preaudit

Ken Florey said that the latest preaudit shows Region II is \$80-\$100 K in the red for FY88. Headquarters has instructed him to solve this problem on the regional level. He indicated that this money shortfall could be solved by scaling back new programs (e.g. the proposed spawn deposition study) this year and plan for a more comprehensive study in FY89.

- C. FY89 Budget Outlook
- D. Cordova CF Personnel Issues

1. Need for two new FB I seasonals

James Brady and Mike Thompson outlined the duties that the new FB I seasonal would perform from mid-March through November.

- PWS herring: pound monitoring, data entry, and assist with herring catch sampling

- or participate in the spawn-on-kelp herring program

- PWS salmon: setup, supervision, and tracking daily counts for Eshamy and Coghill weir,
- post season data entry and reduction

Chuck Meacham and Sam Sharr outlined a need for an additional FB I between June 1 and November 1 to coordinate the growing CWT recovery program in Prince William Sound. This summer there will be a 10-man crew recovering pink salmon tags for the Valdez Fisheries Development Association (VFDA) and in 1989 the recovery crew is expected to grow to 20 persons. Although the private-non-profit (PNP) hatcheries will be funding these recovery efforts, Fish and Game is currently charged with supervising the recovery effort and analyzing the data that is collected for these programs.

Ken Florey indicated that each of these positions should be funded as indicated for the upcoming 1988 field season.

## 2. New Management Assistant (FB II)

E. Union Contract (or lack of)

F. Welcome Linda Brannian to Region II Biometrics

Chuck Meacham introduced Linda Brannian to the group and indicated that she would be transferring from AYK to the Region II biometrics staff on March 1st. Linda will supervise the Region II biometrics staff and her duties will emphasis herring. Linda will come down to Cordova to familiarize herself with the sac roe fishery this spring and will review operational plans with the staff on a pre and post season basis. Be expecting some phone calls from Linda in the near future.

Chuck indicated that Fred Jamsen will concentrate his future efforts on the development and modification of computer programing for the region.

Ken Florey indicated that another biometrician (6 mm) is currently in the FY89 budget.

II. SPECIAL TOPIC: Discussion of the inter-relationship of the Copper/Bering Rivers sampling program with the Gulkana incubation facility, and inseason management of the commercial fisheries. SEE ATTACHMENT 2.

## A. Stock ID Needs in the Copper River Fisheries

### 1. Management (Brady)

#### a. Commercial Fishery

- (1) 85% of management decisions based on trends observed through Miles Lake sonar.
- (2) From mid-late June, aerial survey of delta stocks are also taken into consideration.
- (3) The Copper River is basically managed as a single stock fishery because we currently have no criteria for the management of upriver vs delta stocks.
- (4) It might be possible to use time and area management strategies, if the fishery were restricted inside the bars of the Copper River delta, however the offshore fishery is targeted on mixed stocks in salt water.
- (5) Need to propose new stat areas that differentiate inside vs outside bar catches to document this interception of mixed stocks outside.
- (6) Don't feel that management will be able to meet the escapement objectives for all three (upriver, delta, and hatchery) stocks every year.

#### b. Subsistence/Personal Use Fisheries (Roberson)

- (1) Have reasonable run timing data on wild stocks.
- (2) With regard to hatchery vs wild sockeye stocks
  - 3 years of significant tag returns; data variable, need to continue data collection for timing and contribution information about Summit Lake releases
  - will recover more CWT sockeye in 1988 and 1989 from tags already deployed
  - no money to do CWT tagging of Summit Lake releases in 1987 and 1988 (Need \$20 K to fund tagging and \$13 K to fund recovery annually)
  - Tagging and recovery funds have been included in the FY89 budget however there is no guarantee that these budget items will be approved.
  - Need 1 or 2 Sport Fish techs to monitor the subsistence and personal use fishery in the upper Copper River for CWT recoveries. This fishery is currently not being monitored for CWT recovery.



## 2. Research Needs for Stock ID

- a. Would be nice to cross-check delta aerial survey data on major delta tributaries with weirs to strengthen total delta escapement estimates.

## B. Review of Results of Stock ID Techniques in the Copper River Fisheries

### 1. Wild Stocks (Sharr)

- a. Need to quantify upriver vs downriver escapements better. May be able to glean more information by reconstructing the run and back calculating migratory timing curves.
- b. Scale Pattern Analysis - Methods and Results
  - (1) Looking for temporal contribution of upriver vs delta stocks
  - (2) No spacial differences observed in extensive sampling conducted in 1982.
  - (3) Age 1.2 and Age 1.3 Model - accuracy +70%
    - 1982 and 1983 Stock Proportion of Catch at Age 1.3; the percent of delta stocks were higher in the earlier fishery then previously thought; the percentage of delta stocks was much greater overall after June 20th than previously thought.
    - 1984 thru 1986 Stock Proportion of Catch at Age 1.3; the upriver stocks outnumbered the delta stocks throughout these years.
  - (4) Upriver stock historical tagging study review
    - Timing Data from Wood Canyon tagging and Miles Lake. SEE ATTACHMENT 3, Part 1-4.

### 2. Hatchery Stocks (Roberson)

- a. Coded Wire Tagging - Methods and Results  
SEE ATTACHMENT 3, Part 5-12.

## C. Panel Discussion - Stock ID Priorities (Sharr, Chairman)

### 1. Continue existing stock ID and age, sex, and size programs.

- a. Stock ID for temporal and total stock contribution.
- b. Analysis of historical scale pattern analysis

- c. Delta escapement assessment
    - Run reconstruction
    - Ground truth aerial survey data (e.g. weirs)
- 2. Understand escapement of delta stocks.
- 3. Continue tagging and recovery effort for hatchery stocks
  - a. Resume CWT tag application at Summit Lake
    - define program goals
    - reassess the number of fish that need to be tagged to yield adequate recoveries
  - b. In the meantime continue recovery efforts at present levels (30%)
  - c. Apply CWT's to releases at Crosswind Lake.
  - d. Initiate a tag recovery effort for CWT's in the upper Copper River subsistence/personal use fishery.
- 4. Do an analysis of existing scale pattern analysis data
  - a. Examine the feasibility of identifying hatchery fish with existing scale pattern analysis models.
- 5. Redefine stat areas and catch reporting
- 6. Investigate other techniques for differentiating upriver vs downriver stocks in the Copper River (e.g. egg diameter).

### III. GENERAL DISCUSSION TOPICS:

- A. Delegation of Mike Jackson's responsibilities.  
SEE ATTACHMENT 4.

James Brady outline Mike Jackson's former duties and (who) is currently responsible:

- buoys/markers (Subcontractor & FWP)
- weirs - hiring, setup, and supervision (New FB I)
- aerial surveys - 2 per week (Haanpaa-New FB II)
- ground surveys (Brady & New FB II)
- facilities maintenance (Eyak Outlet-subcontracted; also willing to repair Miles Lake sonar rail)
- fry dig (Eyak Outlet - 10 days at \$200/day)

- warehouse (Crew leaders will be responsible for keeping work areas neat and putting their gear away properly at the end of the season.)

B. Test Fishing Programs: Herring, Copper River, and Coghill.

James Brady indicated that we should resume the testfishing program for herring this spring with a contracted purse seiner. Everyone agreed. The general consensus of the area staff regarding test fishing for Copper River coho and Coghill sockeye was that these projects should be put on the back burner for this year. At present it would cost too much to get the information needed to manage these fisheries with test fishing programs and there is no historical data that would enable us to evaluate this new test fishing data. James Brady and Sam Sharr emphasized the need to sample in a systematic manner throughout the season to collect meaningful test fish data. Dennis Haanpaa and Chuck Meacham said that it might be worth while to consider implementing a district specific test fishing program in these areas during extended fishing closures. This would give the manager information about when fish are present and when they are starting to move.

C. Fish & Wildlife Protection (FWP) Program Plans for 1988

Ltn. Rod Mills said that FWP will have the "Burton" and a 32 foot boat in Prince William Sound during the herring fishery this spring. In addition he would also like to place an officer aboard the R/V Montague during peak periods in the herring season. He would like to have an officer along on the annual CBR/PWS marker trips and aboard the R/V Montague during winter sampling trips.

FWP is also planning to have a Cessna 185 on floats stationed in Cordova and a Super Cub will patrol the first few Copper River sockeye openers. James Brady expressed an interest in placing an observer aboard the FWP Super Cub to conduct fleet surveys when they fly their patrols. Ltn. Mills indicated that FWP would be willing to work with him on that request.

They are also planning to station an officer at Main Bay so that they can provide better coverage of the western part of Prince William Sound. On April 15 a state trooper will be restationed in Cordova.

FWP is working closely with the Division of Telecommunications to upgrade their communication capabilities for their Cordova base station and the Burton. Jim Vansant would like to get permission to install the FWP mobile VHF frequency on the R/V Montague to assist with herring operations in the spring and other joint ADF&G/FWP ventures (e.g. search and rescue) during the rest of the

year. Ltn. Mills indicated that they could work on this and at least try to get a mobile VHF unit that could be used on the R/V Montague this year.

Ltn. Mills would like to have his Cordova officers notified about key ADF&G staff meetings. This would include preseason strategy seasons and inseason changes that would help keep FWP abreast of the fishery.

#### D. Fish Ticket Program

Mike Thompson reported that the 1987 PWS/CBR Salmon Catch Summary has been sent out and all other years are current. The data base for 1987 was sent to Juneau and the fish tickets are ready to be sent to the Commercial Fisheries Entry Commission's archives. Mike is putting together an informational package for processors about fish tickets and how to fill them out correctly. This package will be distributed to processors in the Prince William Sound area. In 1987, the Cordova office processed a total of 160 batches of fish tickets at an average rate of 6 batches per day.

Sam Sharr expressed a need for running an inseason check of the fish ticket summaries vs the verbal counts that are received from processors to detect and correct data entry errors.

James Brady is currently recruiting for a Clerk III (8 mm) to work as a fish ticket editor in the Cordova office.

#### E. Seasonal Hiring

Wayne Prigge passed out a list of the seasonals and how they responded to his questionnaire on whether or not they planned to return for the 1988 field season. SEE ATTACHMENT 5.

#### F. Sea Duty, Overtime, etc.

##### 1. Time Sheets

Wayne Prigge indicated that Project Leaders are to make sure that employees fill out the back of their time sheets (start/stop times) completely and accurately and sign the front side of the form. The start and stop times should be recorded in military time. All time sheets will be shipped to Wayne Prigge in Anchorage and accounting will calculate the pay rates for each employee.

##### 2. How To Administrative Booklet

Wayne Prigge and his staff are compiling a Region II Administrative Help Manual that will outline correct procedures and forms required for personnel, purchasing,

etc. To aid in the production of this manual an administrative workshop will be held in Anchorage from February 29 through March 4 to discuss common problems and their solutions.

Wayne also discussed the following topics: travel authorizations, hiring, purchasing, TR's, evaluations, SLWOP, preaudits, non-perms, and risk management. For further information contact Wayne or request a copy of his forthcoming administrative booklet.

#### G. R/V Montague

##### 1. Maintenance Schedule

Jim Vansant said that maintenance work on the R/V Montague is due to be completed by the end of this week and he expects that the boat will be fully operational by February 26th.

John Hilsinger indicated that the R/V Montague will receive \$ 32 K annually for repairs and maintenance as a result of the demise of the vessel shop in Juneau. Next winter they are planning to have the exterior hull painted. A vessels meeting is scheduled to be held in Anchorage from February 29 through March 1.

Ken Florey recommended that they should consider budgeting some time and money to remodel the wheel house of the R/V Montague to upgrade the electronics. A color sounding depth recorder that provides bottom definition is one of the new items that would be desirable.

Ltn. Rod Mills recommended that ADF&G and FWP stagger their winter maintenance schedules for their vessels in PWS so that one or the other boat would be available for search and rescue activities throughout the winter.

##### 2. 1988 Vessel-Use Schedule. SEE ATTACHMENT 6.

Sam Sharr and Gene Sandone would like some additional late season herring samples to document the presence of younger age class fish if the R/V Montague has any free time in its schedule between May 1 and May 10.

#### H. Reporting

Chuck Meacham reported that the Central Region produced 40 percent of the reports that were published in the technical data report series in 1987. Keep up the good work!

Chuck indicated that the Central Region is initiating a new reporting series for all reports produced by the region in 1988. This report series will be known as Regional

Information Reports and they will follow the format outlined in the new informational leaflet which describes reporting procedures for the Commercial Fisheries Division. The Area Data Report series will be merged into this Regional Information series and numbering will be done in Anchorage. SEE ATTACHMENT 7.

#### IV. PROGRAM REVIEW

##### A. Herring

##### 1. Management Outlook

James Brady indicated that he anticipates a healthy herring sac roe fishery in Prince William Sound this spring. The primary age group is expected to be 4 year old fish (1984 Brood Year) with remnants of 7 and 8 year old fish (1980 & 1981 Brood Years). For more information (e.g. harvest goals, etc.) see Brady's informational letter on the 1988 spring sac roe herring fishery for PWS.

Ken Florey said that the herring industry expects about 40,000 metric tons of herring from Alaska annually to satisfy their fixed markets. The industry gauges their moves (floating processors, tenders, and coordination of the fleet) on ADF&G's preseason forecasts. Ken feels that we should attempt to make annual herring forecasts by area. In these forecasts we should stress protection of younger age classes (e.g. 3 year old fish) and fish harder on older age classes.

##### 2. Staffing and Duties

James Brady outlined the following staff assignments and duties for the Prince William Sound Herring season:

	Brady	New Mgt Asst	New FB I	Sharr	Crawford
Purse Seine Mgt	1	2			
Gillnet Mgt 1/	1	2			
Pound Mgt	1	2			
Wild Harvest	1				
Aerial Surveys 2/	1	2			
Survey Calibration	1				
AWL Test Fishing				1	
AWL Sampling				2	1
Spawn Study		1	2		
Daily PROFS 3/					
Copper R/Sonar 4/					

- 1/ Dennis Haanpaa will provide assistance (level 1) with management of the gillnet fishery until a new assistant can be brought on line.

- 2/ Dennis Haanpaa will provide assistance (level 2) with aerial surveys until a new assistant can be brought on line.
- 3/ Jo Mala will take care of PROFS messages under supervision from James Brady.
- 4/ Ken Roberson will come down to Cordova and be in charge of getting the Miles Lake Sonar camp setup this spring.

### 3. Aerial Survey

James Brady presented a report which summarized the last 10 years of herring aerial survey data for Prince William Sound.

Fritz Funk said that he felt the spawn-intensity index that James presented in his report was an encouraging idea. He indicated that the next step would be to develop a better index of intensity.

In future years, this information should be blended into the PWS Herring C&E Report.

### 4. Test Fishing

### 5. Sampling

Sam Sharr indicated that he is planning to go out on the R/V Montague during the upcoming herring season to see how the fishery works and review how commercial catch samples are collected.

Herring AWL samples will be processed in the Cordova office lab by Drew Crawford (FB II), Blaine McKnight (FT I), New Fish Tech I (3 wks), and a fourth volunteer which will be selected daily from a prescheduled spreadsheet of existing and visiting staff members.

### 6. Cohort Analysis and Forecasting

Fritz Funk presented a report entitled "Stock Assessment of Prince William Sound Herring 1973-1987 Using Cohort Analysis". SEE ATTACHMENT 8.

Fritz indicated that cohort analysis is a means of back calculating biomass using the oldest strong age class. It is useful as a calibration tool, however it is not likely to yield any inseason results that can be used by a manager. In the future it may be possible to use cohort analysis to calibrate relative abundance.

### 7. Spawn Deposition Program

Mike Thompson distributed a copy of the draft Project Operational Plan (POP) for the proposed Prince William Sound Spawn Deposition Program. SEE ATTACHMENT 9.

James Brady and Sam Sharr indicated that they felt that this study was a top priority item for PWS herring. Data from this study will be used to enhance aerial survey data by calibrating miles of spawn by key index areas.

Ken Florey said that due to the \$100 K shortfall of funds in the Central Region, this new project should be scaled back to a budget of \$25 K or less in 1988. This year will be a pilot study designed to give personnel experience and enable them to refine data collection techniques in a limited number of areas. Depending on the results of this years study and the availability of funds next year, we will expand the spawn deposition study in 1989.

James Brady suggested that the private vessel charter be dropped from the 1988 spawn deposition study in order to help keep operating costs within the proposed \$ 25 K budget. In place of the vessel charter, the R/V Montague should be reassigned to the spawn deposition study after the PWS herring sac roe seine fishery. The R/V Montague's other duties during this time period could be preformed by the FWP vessel "Burton". Lt. Rod Mills (FWP) agreed to a joint use of the "Burton" during the PWS herring gillnet fishery and the wild harvest of herring spawn on kelp this spring. Therefore the "Burton" can be used as a platform for fisheries managers and enforcement personnel during these fisheries.

Fritz Funk recommended bringing some of the experienced spawn deposition survey divers up from the Southeastern Region to help calibrate divers (SEE ATTACHMENT 10), assist with surveys, and help get the PWS spawn deposition study off the ground.

Ken Florey thinks he will be able to get Keith Schultz to help out with the PWS spawn deposition study from April 1-15.

#### 8. Herring Catch and Age Report

Gene Sandone presented the conclusions of the PWS Herring Catch and Age Report that was recently completed. SEE ATTACHMENT 11.

Ken Florey indicated that we may need to enlist the aid of the departments hydroacoustic expert to answer some of the questions that were raised by Gene's report with regard to the fall food/bait herring fishery at Knowles Head.

Gene Sandone, Sam Sharr, Linda Brannian, and Drew Crawford should work together to publish the PWS Herring Catch and Age Report on an annual basis in future years.



B. Copper/Bering River Districts

1. Management Outlook

James Brady anticipates that the salmon fishery on the Copper River will open on Monday, May 16th this year.

2. Markers

3. Miles Lake Sonar

4. Aerial Surveys - Upriver and Delta

Ken Roberson and Sam Sharr both indicated that their aerial survey budgets were short for the 1988 season. Ken Florey instructed Dennis to add money for upriver and delta surveys to the FY89 budget.

5. Catch Sampling

Drew Crawford reported that the AWL catch sampling program will remain basically the same in 1988 as it has been conducted in the last few years. However based on an analysis of historical catch and age composition data, we were able to fine tune our sampling scheme in 1988 and reduce the number of strata that will be sampled in a few instances. SEE ATTACHMENT 12.

A presentation of these proposed changes and how they were arrived at was give to Chuck Meacham, Linda Brannian, and Ken Roberson.

6. Subsistence - Personal Use - Batzulnetus

C. Coghill

1. Management Outlook

2. Weir Supervision

The new FB I will be the coordinator for the Coghill weir project. This person should time his/her visits to the weir to coincide with the early, middle, and late AWL samples. If a problem develops with the AWL sample, ask Sam or Drew for whatever assistance is needed.

The seasonal personnel for the Coghill weir are not certain at present.

D. Eshamy

1. Management Outlook

James Brady expects to open the salmon season at Eshamy on June 20th. Fishing will be open Monday through Friday in the outer district and continuous fishing will be allowed in the Main Bay subdistrict during the Main Bay hatchery chum run (80,000 to 100,000 chum available for harvest). After July 20th, the Crafton Island Subdistrict will be managed according to sockeye escapement trends at the weir.

## 2. Weir Supervision

The new FB I will be the coordinator for the Eshamy weir project. This person should time his visits to the weir to coincide with the early, middle, and late AWL samples. If a problem develops with the AWL sample, ask Sam or Drew for whatever assistance is needed.

Eshamy weir will gear up on 6/27. The R/V Montague will set sail with the camps gear on 6/28. The crew will arrive on 7/5 and operate the weir through 9/15.

## E. PWS Pink and Chum

### 1. Management Outlook

### 2. Aerial Surveys

Chuck Meacham posed the following question. Currently we aerial survey 200 index streams out of 800-900 salmon spawning streams in the Prince William Sound area. Is this data good enough to use?

James Brady responded that this is the best information that we have and that he feels that it is good enough to use. To insure the quality of aerial survey data, surveyors need to calibrate themselves periodically by ground truthing their aerial counts.

Chuck indicated that he felt the next step would be to process aerial escapement index data using area-under-the-curve software to convert them to total escapement estimates.

### 3. Markers/Stream Walking

### 4. Computer Demonstration - pink/chum aerial survey maps

Fred Jamsen gave a computer demonstration of a new pink/chum aerial survey mapping program. SEE ATTACHMENT 13.

## F. Hatchery Issues

Based on Sam Sharr's forecast, James Brady anticipates a return of 16 million salmon to Prince William Sound in 1988 and 5.8 million of these fish should be hatchery produced fish. The first general fishing opener is expected to occur

in the Eastern district first week of July. The Valdez Fisheries Development Association (VFDA) will probably begin their cost recovery harvest of hatchery returns starting in the third week of June.

## 1. VFDA Annual Management Plan

James Brady outlined some of the major changes in VFDA's annual management plan. This year they have budgeted \$25 K to fund a Coded Wire Tag (CWT) recovery program for pink salmon in 1988. ADF&G will supervise the data collection effort for this program and perform the analysis of the CWT recovery data. VFDA has also budgeted \$250 K annually for a run failure fund.

### a. Boulder Bay fry release

James Brady indicated that the staff reviewed this permit and felt that it will produce another Terminal Harvest Area (THA) in Boulder Bay and therefore did not support these alterations to the permit. However, after a meeting with VFDA, PWSAC, and others, he agreed to support the request with the following restrictions. VFDA is responsible for evaluating the project and it will have a 3 year time limit.

### b. STHA boundaries and possible use.

James also discussed a new harvest strategy for VFDA fish. SEE ATTACHMENT 14. VFDA will conduct early hatchery sales harvests in the secondary terminal harvest area (STHA) prior to the opening of the common property fishery. The STHA boundaries have been redefined and this area will also be used for special openings for the common property fishery.

## 2. Ester/AFK Management Plan

James Brady said that he hadn't received these management plans yet and that the tie up was most likely due to the problems with the anticipated Cannery Creek hatchery transfer. If the transfer does occur the sales harvest figures requested for Ester would be increased to cover the operating cost at the Cannery Creek facility (no harvestable returns expected to Cannery Creek in 1988).

James also provided the following information about these two hatcheries. The Ester facility is expecting a return of 230,000 chums in 1988 and they will need 25,000 to satisfy their brood stock needs. Ester is also expecting a total return of 3.7 million pink salmon in 1988. The AFK hatchery is expecting a total return of 6.2 million pink salmon this year.

### 3. Cannery Creek status

Tim McDaniels explained that since the sole source contract to the aquaculture associations was contested in court, the contract for any interested parties to take over the operation of selected state salmon hatcheries has since gone out for competitive bids. In the meantime, the legislature has appropriated money for the operation of these hatcheries. This money will be administered by the FRED Division and distributed to the Aquaculture Associations for operation of the hatcheries in question.

### 4. CWT Marking Programs

#### a. 1987 Pink CWT Study - Results

Larry Peltz presented the results of the 1987 Pink CWT Study in Prince William Sound. SEE ATTACHMENT 15.

#### b. Outlook for continued evaluation programs.

Larry indicated that after discussing the results of this study at a recent meeting with the PNP hatchery supervisors, they decided to fund the cost of deploying CWT's in all hatchery fish that will be released in 1988. Therefore the future for CWT programs in the Prince William Sound area looks bright. They are expected to provide valuable information on run timing and hatchery contributions to the common property fishery that will be helpful to fishery managers and hatchery managers.

### 5. Hatchery Monitoring and Management Coordination

Ken Florey indicated that ADF&G needs a hatchery management coordinator position that would be funded by the PNP hatcheries. This position would be responsible for tracking down the information that ADF&G needs such as run timing and sex ratios. He would also like to make the PNP's responsible for dedicating the funds and the personnel for CWT tag recovery.

## V. LEFT OVERS

### A. Discussion of next years PWS annual staff meeting agenda topics.

### B. Other Topics Discussed

#### 1. Bunkhouse Move

Mike Thompson said that the move went well, the building has been reassembled at the new sight, and it is clean and ready for the 1988 field season. There are still a few miscellaneous items that need to be cleaned up and removed from the old warehouse site.

## 2. Hazardous Waste

Mike Thompson oversaw the subcontractor that removed the sodium arsenite from the sheds by the old ADF&G bunkhouse in January. The material was transferred into special containers and then stored in the yard by the warehouse. Jim Vasant said that the containers of hazardous waste were picked up on February 16th and transferred to the subcontractor who is in charge of shipping these containers to an approved disposal site.

## 3. Divisional Meeting in 1989

Ken Florey mentioned that there is a possibility of having a divisional meeting next year that would be held in conjunction with abbreviated versions of the annual regional staff meetings. There are currently 134 full time employees in the Commercial Fisheries Division and they haven't meet as a group to discuss common interests and problems since 1981.

## 4. Board of Fisheries Meeting - Spring 1988

James Brady will submit proposals to get rid of all published fishing schedules for salmon in the regulations for the Copper/Bering River districts, the Prince William Sound seine fishery, and the Coghill district. He feels that all of these openers should be managed by emergency order.

## 5. PWS Regional Planning Team (RPT) Meeting

The next RPT meeting for the Prince William Sound area is scheduled for some time in late March. Be prepared for a lengthy discussion about Eshamy.

## 6. Sport Fish Division Activities in PWS 1988

Kevin Delaney will have a 2-man crew stationed in Valdez this summer from 6/15 through 9/15. They will be conducting a creel census of sport caught salmon in Valdez Arm. The crew will be made up of one Fish Tech III and a second person provided by the Valdez Fisheries Development Association. Surveys will be conducted on the water with a 17' Boston Whaler powered by an 85 h.p. outboard.

Larry Peltz indicated that if time permits it would be helpful to have the Valdez crew come to Cordova around Labor

Day to conduct additional creel censuses of the coho sport fishery that has developed at Flemming Spit.

Kevin Delaney indicated that he may also have a sampling program for cutthroat trout in Cordova this summer if pending funds for this study are approved by the U.S. Forest Service. This study would be conducted from the road system out of Cordova. The objectives of the study are to evaluate resident and anadromous stocks of cutthroat trout in the area and determine the sport fishing potential for each.

Kevin also was also interested in how the staff felt about adjusting existing fishing regulations to provide additional sport fishing opportunities in the upper Copper River for chinook salmon. He indicated that there were about 5,000 chinook salmon harvested by sport fishermen in this area in 1987. Specifically, he wanted to know how many chinooks are available for sport fish harvest and how much could they ease the regs without creating a problem. Some ideas he threw out were: weekend-only fisheries, fly-only areas, restricting fishing to more remote areas, and setting specific fishing closure dates for major tributaries such as the Gulkana and Klutina rivers. Ken Roberson said that the present escapement goal for the upper Copper River is 15,000 chinook salmon. This escapement goal is evaluated annually via aerial surveys of index streams.

Ken Florey said that the Central Region anticipates putting in a dual-beam sonar at Miles Lake at some point in the future. This would differentiate sockeye and chinook and give a better handle on chinook escapements past the commercial fishery in the Copper River delta. Therefore, Kevin will have to wait for some time in the future for a definitive answer to his questions about Copper River chinook.

# Attachment 1

## ANNUAL STAFF MEETING AGENDA FEBRUARY 17 - 19, 1988 ANCHORAGE

(8:30 A.M., February 17)

### I. REGIONAL REVIEW

- A. Comments from Headquarters (if any)
- B. FY 88 preaudit
- C. FY 89 Budget outlook
- D. Cordova CF personnel issues
  - 1. Need for new FB I seasonal (10 mm)
  - 2. New Management Assistant
- E. Union contract or lack of
- F. Welcome Linda Brannian to R-II biometrics (Meacham)

} Parker

(1:00 p.m. February 17)

- ### II. SPECIAL TOPIC:
- Discussion of the inter-relationship of the Copper/Bering Rivers sampling program the Gulkana incubation facility, and in-season management of the commercial fisheries.

--- Separate agenda provided by Sam Sharr ---

(8:30 a.m., February 18)

### III. GENERAL DISCUSSION TOPICS:

- A. Delegation of Mike Jackson's responsibilities
- B. Test Fishing programs; herring, Copper River, Coghill
- C. Ltn. Rod Mills, FWP, Program plans for 1988 season
- D. Fish ticket program (Thompson)
- E. Seasonal Hiring (Prigge)
- F. Sea duty, overtime, etc. (~~Haanpaa~~) Prigge
- G. Montague maintenance status (Vansant)
  - 1. 1988 vessel use schedule
- H. Reporting

### IV. PROGRAM REVIEW

#### a. Herring

- 1. Management Outlook (Brady)
- 2. Staffing and duties (Brady et.al.)
- 3. Aerial Survey (Brady)
- 4. Test Fishing (Brady)
- 5. Sampling (Sharr)
- 6. Cohort analysis and forecasting (~~Sharr~~) Funk
- 7. Spawn Deposition Program (Thompson)
- 8. Herring Catch and Age Report (Sandone)

#### b. Copper/Bering River Districts

- 1. Management Outlook (Brady)
- 2. Markers (Thompson)
- 3. Miles Lake Sonar (Thompson)

4. Aerial Surveys, upriver and delta (Sharr/Roberson)
  5. Catch sampling (Crawford)
  6. Subsistence/PU/Batzulnetus (Roberson)
- c. Coghill
1. Management Outlook (Brady)
  2. Weir supervision

- D. Eshamy
1. Management Outlook (Brady)
  2. Weir supervision

(8:30 a.m. Feb. 19)

- E. PWS pink and chums
1. Management Outlook (Brady)
  2. Aerial surveys
  3. Markers/stream walking
  4. Computer Demo - pink/chum aerial survey mapping (Jansen)
- F. Hatchery Issues
1. VFDA Annual Mgmt. Plan (Brady)
    - a. Boulder Bay fry release
    - b. STHA boundaries and possible use.
  2. Esther/AFK, mgmt. plans
  3. Cannery Creek status
  4. CWT marking program results from 1987 (Peltz)
    - a. Outlook for continued evaluation programs.
  5. Hatchery monitoring and Mgmt. coordination.

V. LEFT OVERS

- A. 1989 PWS Annual Staff Meeting Agenda Topics - Discussion
- B.
- C.




## M E M O R A N D U M

STATE OF ALASKA - DEPARTMENT OF FISH AND GAME

TO: Chuck Meacham  
Regional Research Supervisor  
Commercial Fisheries  
Region II - Anchorage

DATE: 19 Jun. 1988

FILE:

FROM: Sam Sharr   
Area Research Biologist  
Commercial Fisheries  
Cordova

SUBJECT: Copper River Stock  
Separation Panel  
Discussion for PWS  
1988 Staff Meeting

Please review the following brief outline for the stock biology panel discussion proposed for the February staff meeting. The outline is divided into three main sections. The first asks specific people to briefly discuss current stock related problems in the Copper River fisheries; the second asks specific people to review the results from current stock ID programs and; the third opens the floor for a discussion by all parties about applicability of current stock ID programs and program needs for the future. In parentheses next to each topic in the first two sections I have suggested people I feel are most appropriate to discuss the topic and indicated the approximate amount of time they are to be allocated. In some cases my suggestions are designed to take advantage of current staff expertise. In other cases the suggested topic assignments are designed to allow new personnel to get their feet wet and acquire some expertise.

# I. Stock ID Needs in the Copper River Fisheries

## A. Management

- 1) Commercial Fishery (Thompson 10 minutes)
  - a) Wild Stocks
    - 1) Upriver vs Delta
    - 2) Upriver stock groups
  - b) Hatchery vs wild stocks
- 2) Subsistence/Personal Use Fisheries (Roberson 10 minutes)
  - a) Wild stocks
  - b) Hatchery vs wild stocks

## B. Research

- 1) Upriver brood tables, forecasting and escapement goals (Roberson 5 minutes)
- 2) Run Reconstruction and Delta escapement estimate (Sharr 5 minutes)

# II. Review of Results of Stock ID Techniques in Copper River Fisheries.

## A. Wild stocks

- 1) Upriver vs Delta
  - a. Scale Pattern Analysis (Sharr/Crawford 40 min)
    - 1) Methods and results 1981 - 1987
- 2) Upriver Stock Groups
  - a. Historic tagging studies- brief review (Roberson 10 min)

## B. Hatchery Stock

- 1) Coded Wire Tagging (Roberson 20 min)
  - 1) Methods and Results 1984-1987

III. Panel Discussion - How are we doing and where do we go from here?

A. Applications of current programs: How are we doing?

1.) Inseason Applications

2.) Long Range Applications

B. Future Stock ID needs; Where do we go from here?

cc: Brady

Thompson ✓

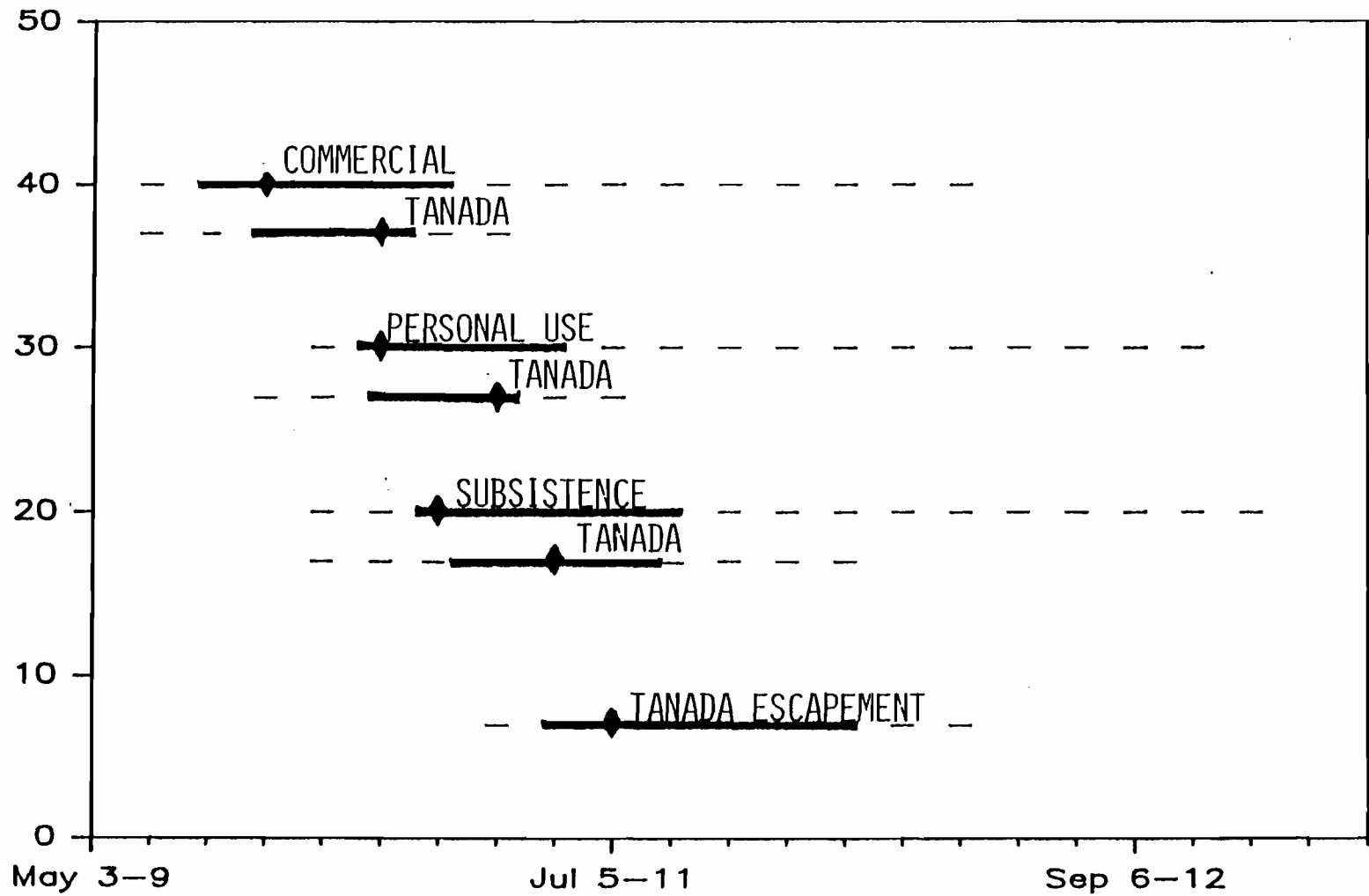
Roberson

Crawford

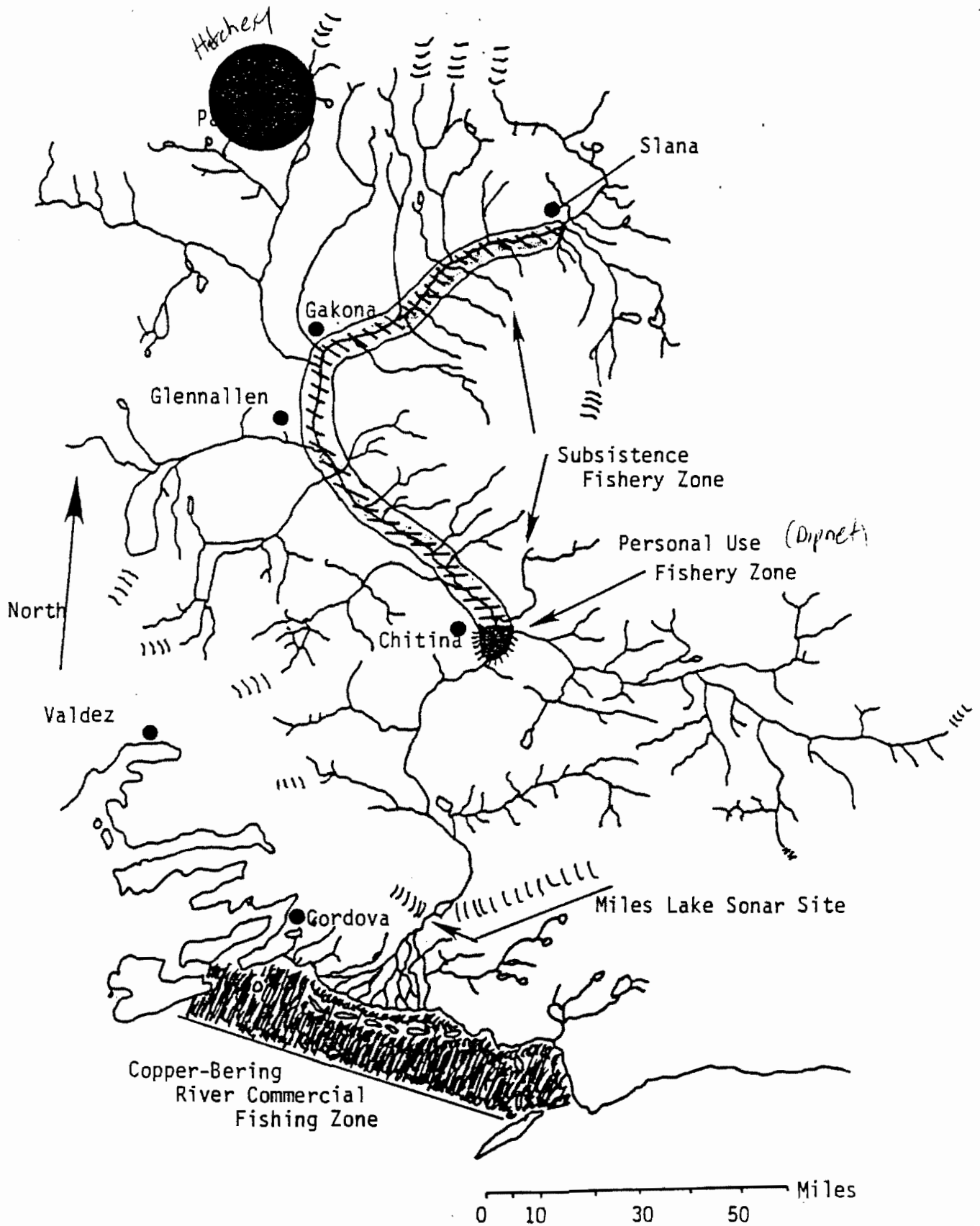
Haanpaa

Florey

# FISHERY HARVEST AND TANADA TIMING



# Attachment 3



This table contains Cooper River Sockeye Salmon Return per Spawner calculations and data.

ESCAPEMENT								RETURN				
YEAR	DELTA		UP RIVER		SPORT CATCH	ADJUSTED ESCAPEMENT	TOTAL SPAWNING ESCAPEMENT	YEAR	COMMERCIAL CATCH	TOTAL ESCAPEMENT	TOTAL	RETURN PER SPAWNER
	INDEX	EXPANDED ESCAPEMENT	INDEX	SUBSISTENCE CATCH								
1966	41043	82086	25187	21884	300	315344 B	397430	1971	616801	628779	1245580	3.13
1967	18605	37210	20257	18985	400	132090 B	162300	1972	727144	445253	1172197	6.92
1968	16686	37372	27494	20230	700	212320 B	249692	1973	332816	233702	626598	2.51
1969	41573	83146	36348	29175	1500	468271 B	551417 A	1974	607766	244566	852332	1.55
1970	87603	175206	73845	42694	1800	250675 B	433881	1975	335687	203620	539307	1.24
1971	71087	142174	69982	40413	4000	434192 B	576266 A	1976	865195	296170	1151365	2.01
1972	81142	162284	31581	32386	2000	248383 B	410667	1977	619140	410426	1029566	2.51
1973	44795	89590	64345	29593	4000	170599 D	260189	1978	249872	294149	544021	2.09
1974	32321	64642	29117	26076	3000	150048 D	215490	1979	60520	504023	554551	2.71
1975	48735	97470	11190	15384	200	90566 D	188036	1980	18320	657928	676816	3.60
1976	66475	132950	21076	23655	1000	138565 D	271515	1981	477662	842963	1320625	4.86
1977	60820	121640	66463	41853	3652	243271 D	364911	1982	1177022	609516	1857148	5.12
1978	93569	187138	21388	22100	1006	83305 C	270443	1983	633010	784624	1417634	5.24
1979	133425	266050	27723	30735	1599	204779 C	471629 A	1984	994776	822785	1720562	3.65
1980	190685	381370	46105	35101	2103	239330 C	620639 A	1985	925365	722413	1645778	2.65
1981	153850	307700	70920	60687	1523	465053 C	772753 A	1986	782800	659192	1439990	1.96
1982	111105	222210	82145	109766	3343	354237 C	576447 A	1987	1181205	642370	1823575	3.16
1983	119450	238900	70810	118733	2619	424372 C	663272					3.23
1984	141990	283980	85790	70072	3267	455467 C	739447					
1985	142050	284100	46165	64200	7613	364520 C	640620					3.23
1986	75295	150590	49593	72470	4137	431993 C	502583					
1987	83318	166636	53540	81150	3000	391584 C	550200					

\* = Preliminary

A = Average of six largest spawning population years = R/S =

2.49

B = Tagging estimate less subsistence catch

C = Sonar estimate less subsistence/personal use and sport catch

D = Index \* 5.9 observation factor correction based upon sonar and tagging.

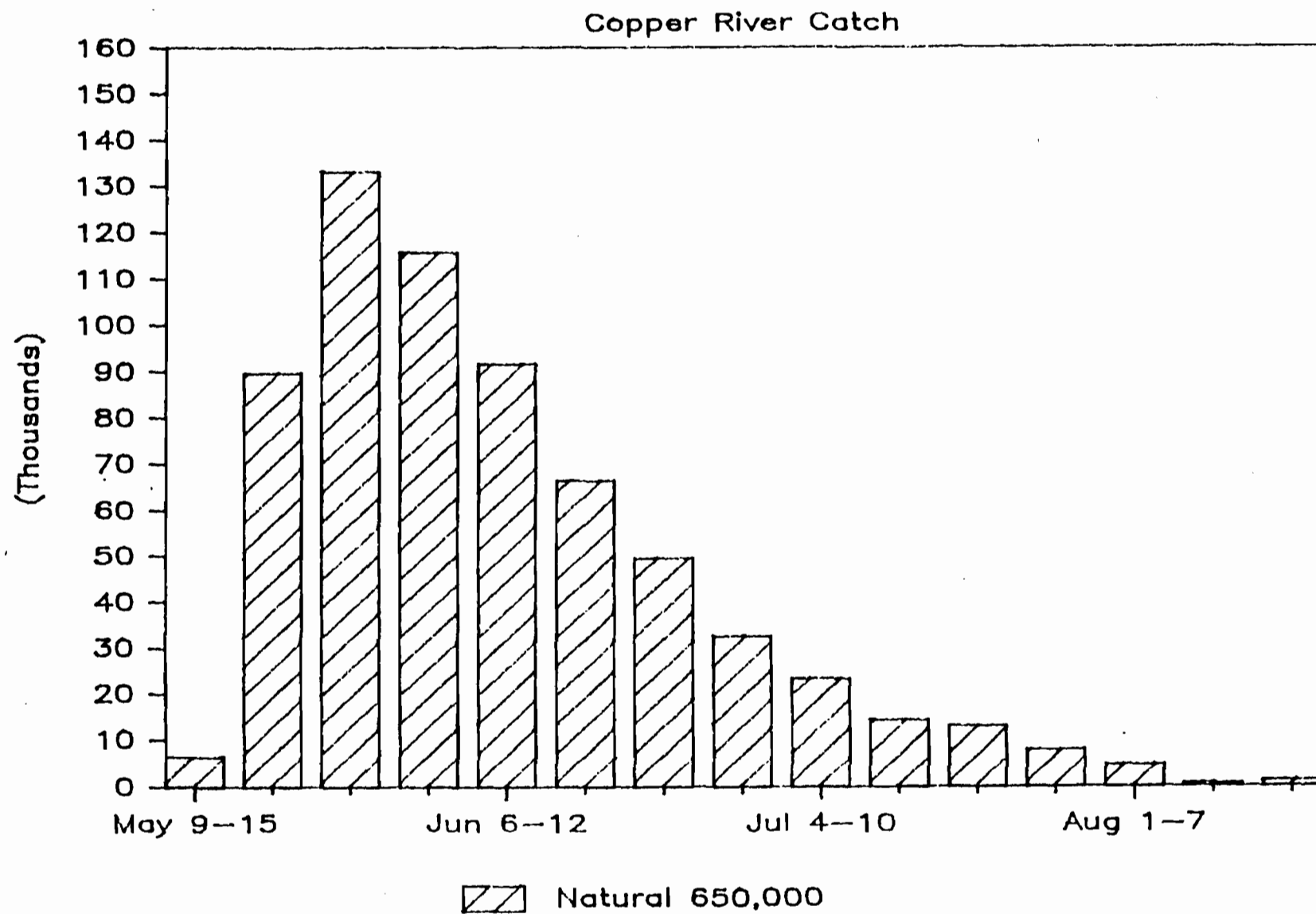
E = Delta Index \* 2 is expansion figure

F = Total escapement less subsistence/personal use and sport catch

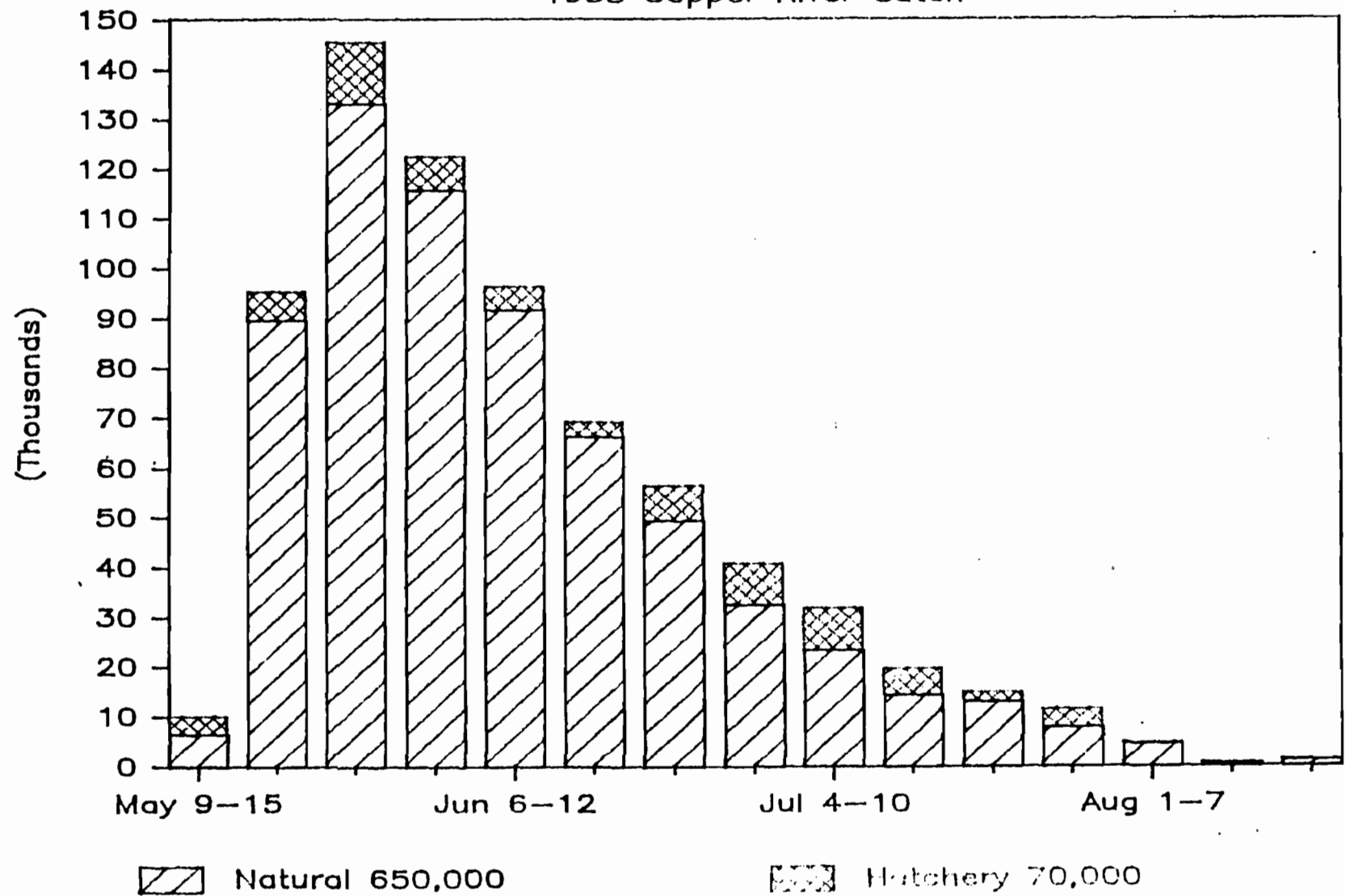
1967 Data preliminary

See:

Merritt, M. F. and K. Roberson. 1986. Migratory timing of Upper Copper River sockeye salmon stocks and its implications for the regulation of the commercial fishery. *North American Journal of Fisheries Management* 6:216-225.

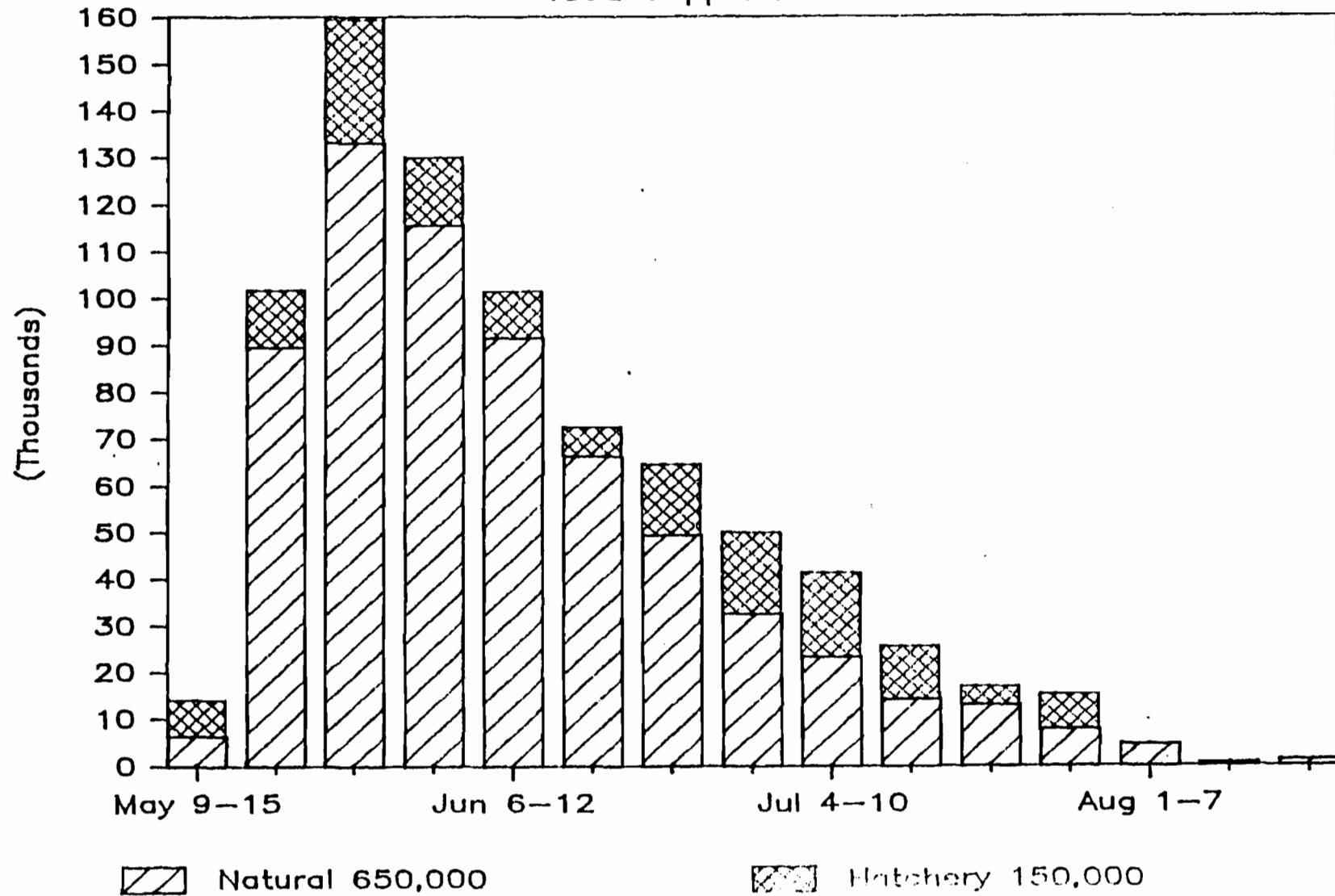


1988 Copper River Catch



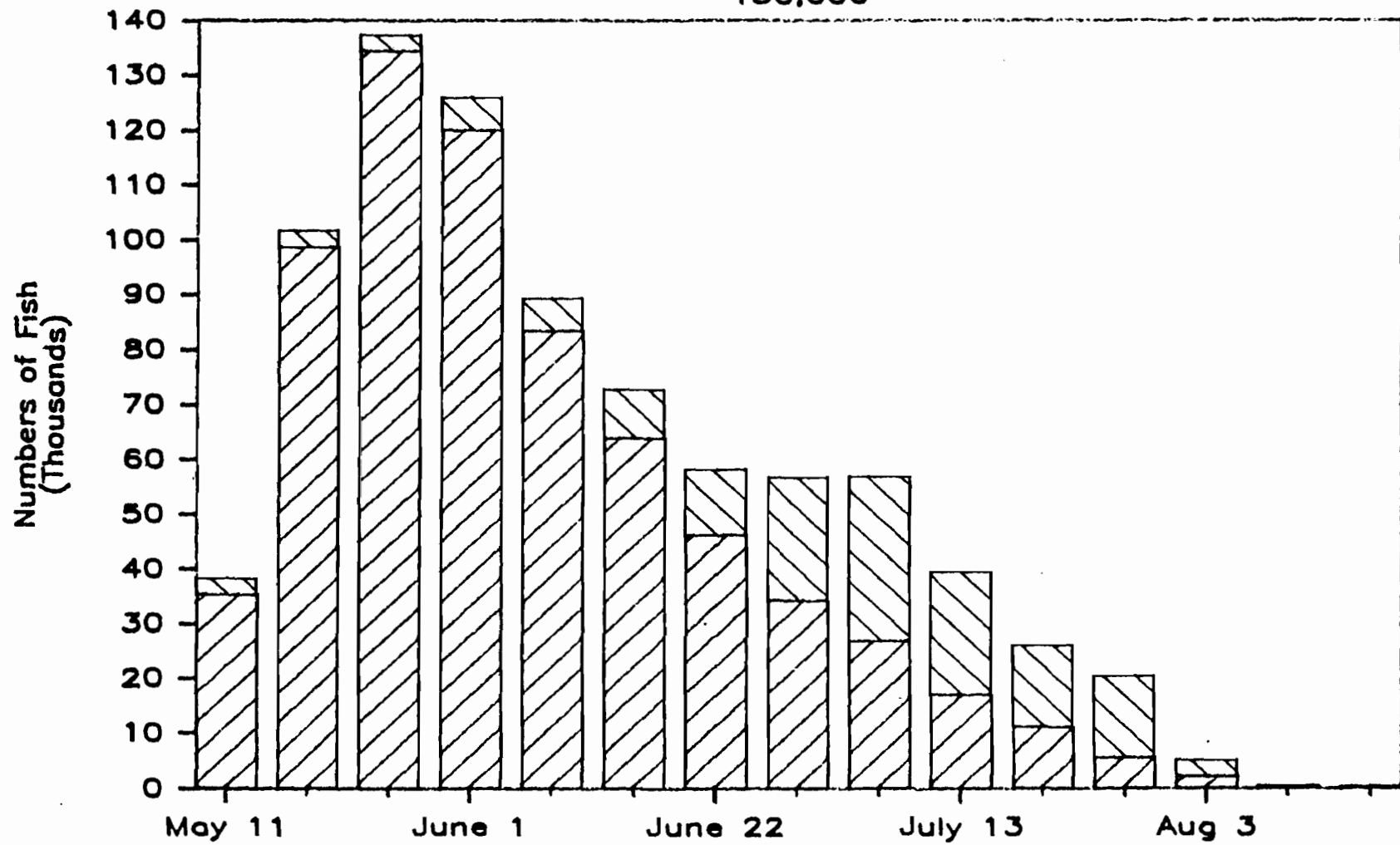


1990 Copper River Catch

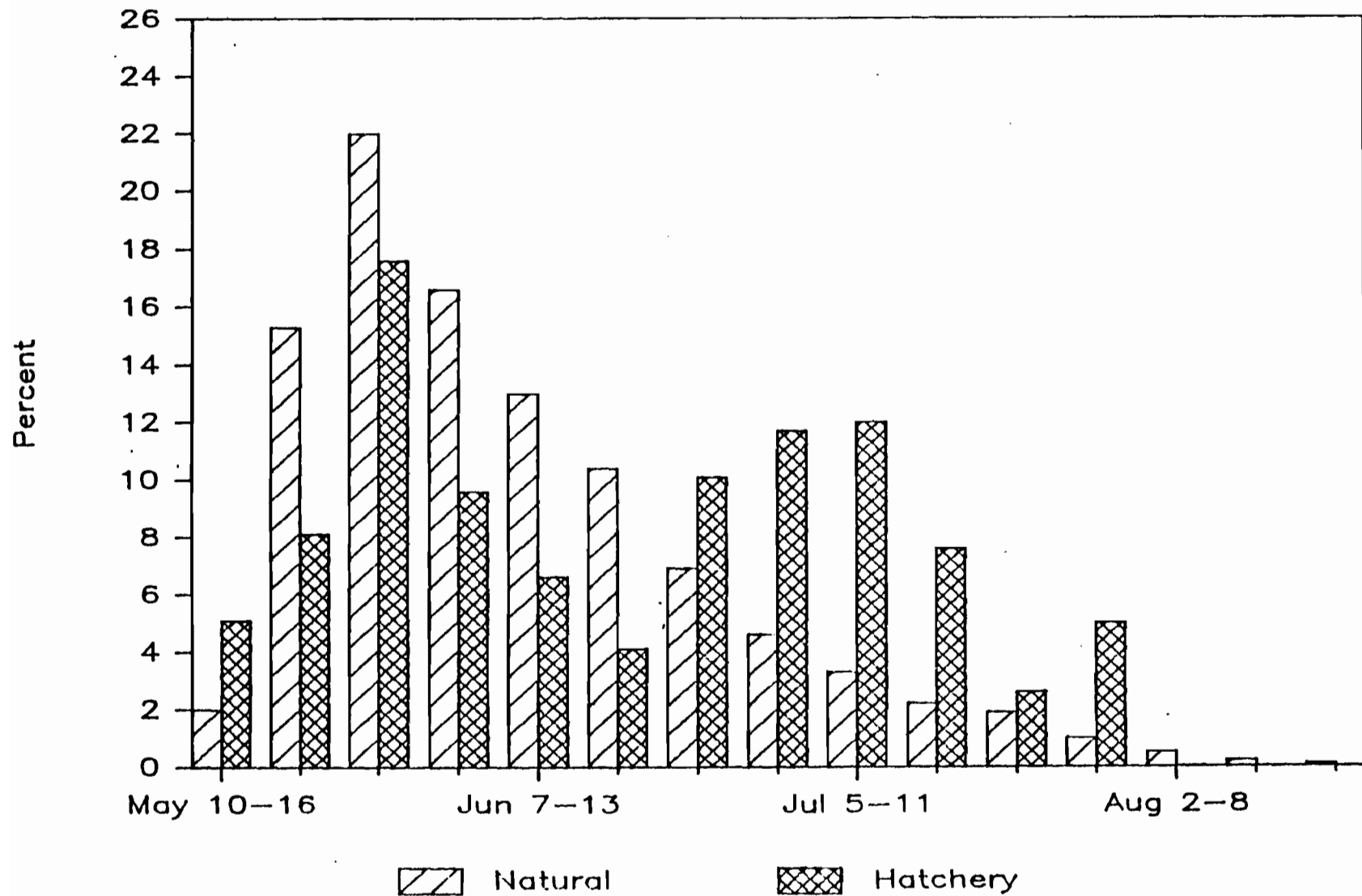


# Estimated Enhanced Catch

150,000

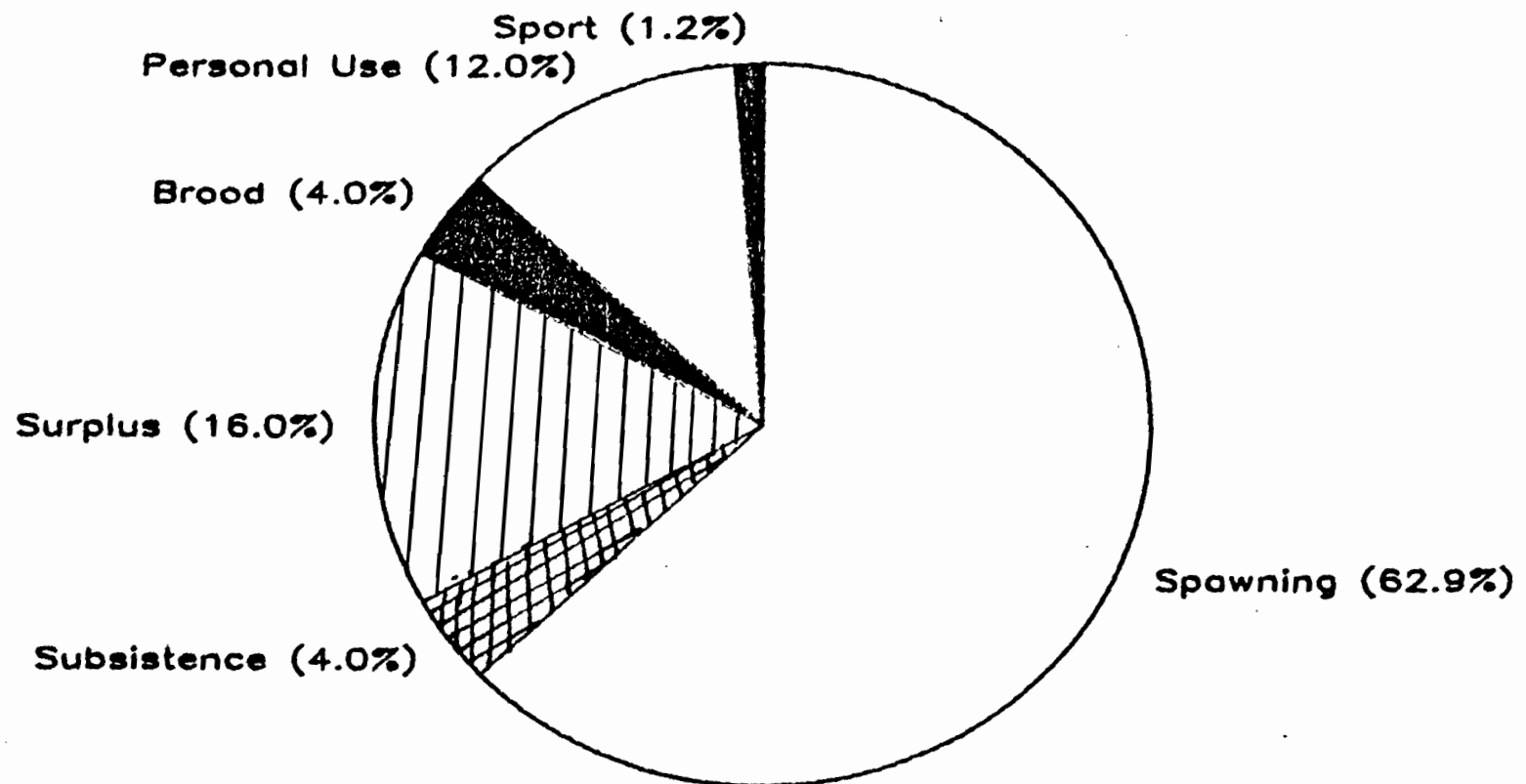


# COMMERIAL FISHERY NATURAL AND ENHANCED STOCK HARVEST TIMING

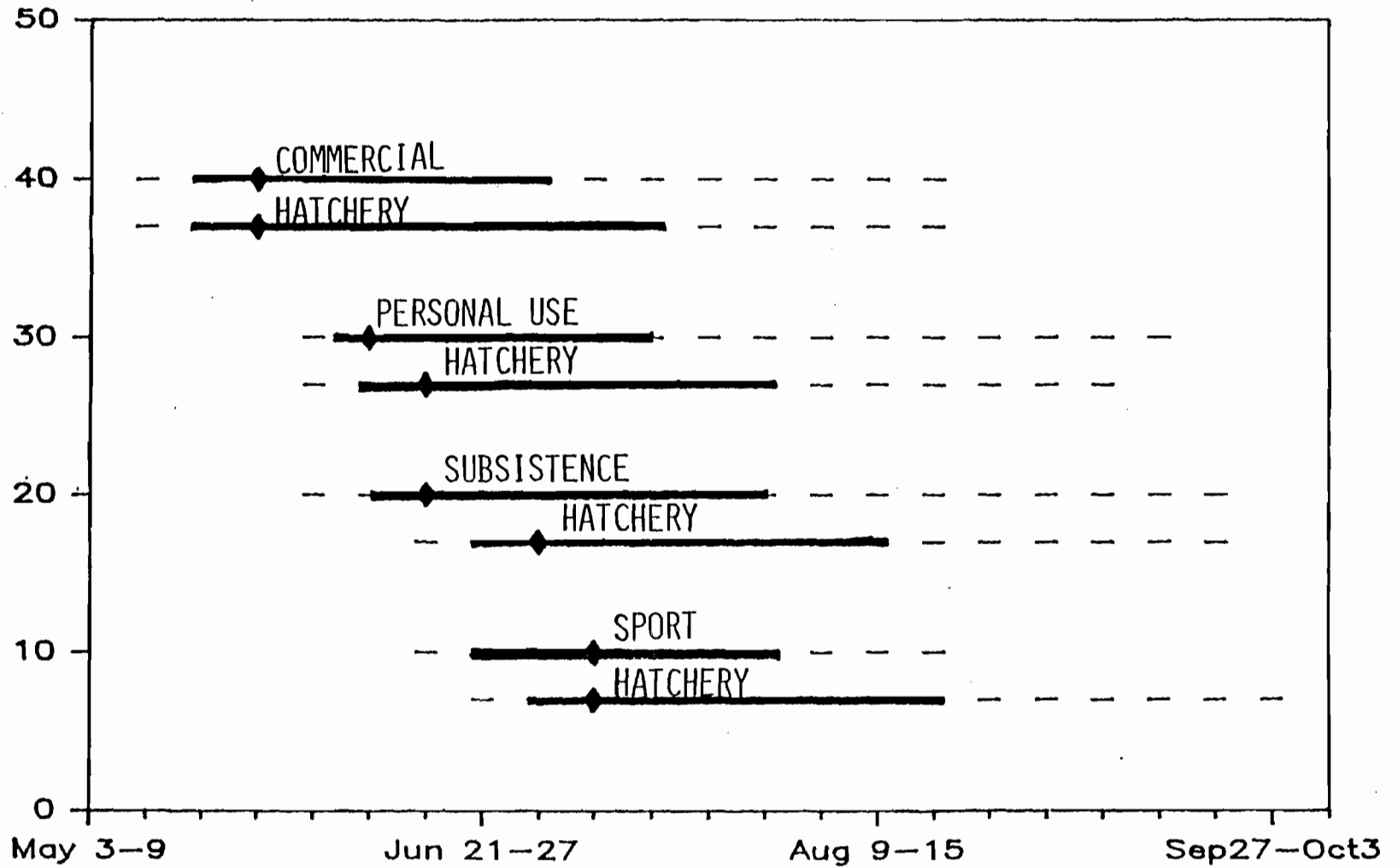


# Copper River Escapement Allocation

1990 Example



# FISHERY HARVEST AND HATCHERY TIMING



Appendix Table 1. Expected weekly catch and escapement, Copper River, 1988

Date	Week	1/ Anticipated Commercial Sockeye Catch					2/ Supplemental Production		3/ Comb. Harvest	4/ Cumul. Harvest	4/ Wild Expt.	5/ Antic. Escape	5/ Supple. Escape	6/ Comb. Escape	6/ Cumul. Escape
		Stat.	Percent	Cumm. Percent	Minimum	Point	Maximum	Percent	Catch	Harvest	Harvest	Percent	Escape	Escape	Escape
May 9-15	20	1.0	1.0	5417	6304	7191	5.1	3610	9914	9914	0	0	0	0	0
May 16-22	21	13.8	14.8	74755	86997	99236	8.1	5733	92730	102644	9946	5.1	2407	12353	12353
May 23-29	22	20.5	35.3	111049	129234	147416	17.5	12387	141621	244266	43813	8.1	3822	37689	50041
May 30-Jun 5	23	17.8	53.1	96423	112213	128000	9.6	6795	119009	363274	126465	17.5	8258	90910	140951
Jun 6-12	24	14.1	67.2	76380	88808	101393	6.6	4672	93560	456834	209980	9.6	4530	88045	228997
Jun 13-19	25	10.2	77.4	55253	64302	73348	4.1	2902	67204	524038	258272	6.6	3114	51407	280404
Jun 20-26	26	7.6	85.0	41169	47911	54652	10.1	7149	55060	579099	289056	4.1	1935	32719	313122
Jun 27-Jul 3	27	5.0	90.0	27085	31521	35955	11.7	8282	39802	618901	315032	10.1	4766	30741	343863
Jul 4-10	28	3.6	93.6	19501	22695	25888	12.0	8494	31189	650090	340349	11.7	5521	30839	374702
Jul 11-17	29	2.2	95.8	11917	13869	15820	7.6	5380	19249	669338	367927	12.0	5663	33241	407943
Jul 18-24	30	2.0	97.8	10834	12608	14382	2.6	1840	14449	683787	395875	7.6	3586	31534	439477
Jul 25-31	31	1.2	99.0	6500	7565	8629	5.0	3539	11104	694891	407301	2.6	1227	12653	452130
Aug 1-7	32	0.7	99.7	3792	4413	5034	0.0	0	4413	699304	410959	5.0	2359	6017	458147
Aug 8-14	33	0.1	99.8	542	630	719	0.0	0	630	699934	411000	0.0	0	41	458188
Aug 15-21	34	0.2	100.0	1083	1261	1438	0.0	0	1261	701195	411000	0.0	0	0	0
Totals		100.0	100.0	541700	630412	719100	100.0	70783	701195	701195	411000	100.0	47188	458188	458188

1. Based upon average historic catches for comparable dates.
2. Based upon limited survival data and limited tag recoveries in the commercial catch as well as historical in-river tagging data.
3. Anticipated natural production harvest plus anticipated supplemental production harvest.
4. Sonar enumerated escapement at Miles Lake includes all species. Does not include 80-90,000 sockeye bound for delta streams.
5. Expected escapement includes 20,000 for brood stock (hatchery produced escapement), thus total supplemental (47,188) includes 20,000 for brood stock and 27,188 excess.
6. Anticipated natural and supplemental production (includes brood stock requirements).

PRINCE WILLIAM SOUND STAFF COMMERCIAL FISHERIES PROJECT RESPONSIBILITIES.  
PROPOSED (1-7-86) Haanpaa

## H LING

	Brady	Randall	McCurdy	Jackson	Sharr Roberson
Purse Seine Mgmt	2	1			
Gillnet Mgmt	1	2			
Pound Mgmt	1	2			
Wild Kelp Mgmt	1			2	
Bait/food Mgmt	1	2			
Aerial Survey	1	1		2	
Postseason Fish Tick	1				
Testfishing			(1)	2	
AWL Sampling/analysis			2	2	1
Cohort Analysis (fcst)			(1)		2
Daily Computer Rpt	2		2		1

## SALMON

	Randall	Brady Roberson	McCurdy	Sharr	Jackson
Copper/Bering Mgmt	1	2			
PWS Seine Mgmt	1		2		
PWS Gillnet Mgmt	1		2		
U.C.R. Aerial Esc			1		
L.C.R. Aerial Esc		2		1	
L.R. Subsistence			1		
C.R. Inseason C&E Anal.		1		2	
C.R. Markers	2				1
PWS Markers	2				1
PWS Aerial Esc	1				2
Inseason Fish Tickets		1		2	
AWL Sampling/Analysis			2	2	1
Stock Allocations				1	
PWS Inseason C & E Anal.			(1)		
Hatchery Coord. & Mq	2		(1)		
PWS/Coghill/Eshamy Fcst			(1)	2	
Pink/Chum Fry Digs			(1)		2
Copper River Fcst			1	2	
Miles Lake Sonar		1			2
Coghill Weir			(1)		2
Eshamy Weir			(1)		2
PWS Habitat Eval	1		2		
U.C.R. Habitat Eval			1		
L.C.R. Habitat Eval		1		2	
Daily Computer Rpt			(1)	2	

## GRAM

General Maintenance	2				1
Office EDP Coord		1		2	

19 FEB 1988

R Ronnie Aldridge  
R Robert Bale  
R Dulce Ben  
Judy Brandt  
R David Branshaw  
R Thomas Brookover  
R Brian Bue  
R Diane Caleb  
R Patrick Chiklak  
R Christelle Cook  
N Dale Corzine  
Randall Davis  
R Gregory Demers  
R Keith Douglas  
R Norma Dudiak  
R Steve Ehrman  
R Ted Feyder  
R Brad Fisher  
R Mark Greenwald  
R Richard Gustafson  
R Debra Hart  
N Mary James  
R Morris Lambdin  
R Alan Levinson  
R Alana Lipkin  
R Marlene Luke  
R Thomas McKenna

R Ralph Andrew  
R Amy Barnsley  
Ross Bolen  
Judy Brandt  
R Kevin Brennan  
R Thomas Brookover  
R William Busher  
Rosemary Carrol  
R Evelyn Chisum  
R Donna Cook  
R Drew Crawford  
R Gino Del Frate  
Michael Domeir  
N Richard Drews  
R Roger Dunbar  
R Richard Feia  
R Mark Fink  
R Victoria Friedman  
R Dennis Gretsche  
R Lee Hammarstrom  
R Bradley Henspeter  
R John Kingeter  
R Kenneth Legg  
R Donald Levinson  
R Dave Lolley  
R Michelle McCallum  
R Blaine McKnight



ATTACHMENT D  
R/V MONTAGUE - ANTICIPATED VESSEL USE 1988

Vansant

MONTH	DATES	WEEKDAYS	WEEKEND DAYS	PROJECT/DIVISION	NUMBER OF PEOPLE	PROJECT LEADER	FIXED OR FLEXIBLE SCHEDULING	COMMENTS
FEB	15-19	5	0	Tanner crab closure enforcement	2	Donaldson & FWP	Flexible	May be earlier if quota is taken sooner } Down for repairs
MARCH	14-25	10	2	PWS Fry Dig	3	Sharr	Fixed	Shake down cruise
APRIL	3/31-4/1	2	0	Herring pound inspection	1	Brady	Fixed	
	4-24	15	6	Herring management	Up to 4	Brady	Flexible	"Worst Case" day count
	25-30	5	1	Herring spawn surveys	4	Thompson	Flexible	Pick up from chartered vessel when available
MAY	1-10	6	4	Herring spawn surveys	4	Thompson	Flexible	Contingent use for mgt. near late AWL
	9-13	5	0	Pot shrimp closure enforcement	2	Donaldson & FWP	Flexible	Depends on closure date. Herring has priority
	16-20	5	0	Dungeness tagging	2	Donaldson	Flexible	
JUNE	5/30-6/3	5	0	Bering River District markers	1-2	Thompson	Flexible	To include Boswell Bay
	6-10	*5	0	Coghill Weir/CF	4-5	Thompson	Flexible	To include FRED freight to Coghill Lake
	13-17	5	0	Dungeness softshell	2	Donaldson	Flexible	
	<del>27-30</del>	4	0	<del>VPDA Hatchery mgt.</del>	1	Brady	Flexible	Depends on run timing and availability of boat
	<del>27-29</del>			<del>Eshamy/Wer/CF</del>				
JULY	5-19	11	4	Tanner crab index	2	Donaldson	Fixed	Same trip logistically
	20-22	3	0	Dungeness softshell to determine opener				
	23-29	5	0	Salmon stream survey	2	Brady	Flexible	May have to be adjusted to allow unloading and clean up following crab trip
AUG	1-9	7	2	PWS stream markers	1	Brady	Flexible	
	17-20	3	1	Dungeness softshell	2	Donaldson	Flexible	Depends on molt timing.
	23-24	2 day trips	0	Orca Inlet Dungeness	2	Donaldson	Flexible	Logistically desirable to do consecutively.
	30-9/2	4	0	Dungeness softshell	2	Donaldson	Flexible	Depends on molt timing
SEPT	6-15	8	2	Tanner crab index	2	Donaldson	Fixed	
OCT	3-7	5	0	Pot shrimp closure enforcement	2	Donaldson & FWP	Flexible	Depends on closure date
NOV								
DEC								

JAN

\* FRED will pay for 1 or 2 days as appropriate  
 "Worst case" day count for balance of FY 88: Weekdays - 72; Weekend Days - 13.

} Maintenance & Overhaul

Attachment 7

AN ANALYSIS OF FORECASTS TO PROJECT  
FISH PROCESSING EMPLOYMENT

By  
Kenneth D. Byrd  
and  
Robert C. Kelp

Regional Information Report 1/ No. \_\_\_\_\_

Alaska Department of Fish and Game  
Division of Commercial Fisheries, Central Region  
333 Raspberry Road  
Anchorage, Alaska

February 1987

1/ Contribution 88-\_\_\_\_ from Cordova area office. The Regional Information Report Series was established in 1988 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.

Attachment 8

2/18/88

DRAFT  
February 17, 1988

STOCK ASSESSMENT OF PRINCE WILLIAM SOUND HERRING 1973-1987,  
USING COHORT ANALYSIS

By  
Fritz C. Funk  
and  
Gene J. Sandone

Fishery Research Bulletin No. 88-\_\_

Alaska Department of Fish and Game  
Division of Commercial Fisheries  
Juneau, Alaska

February 1988

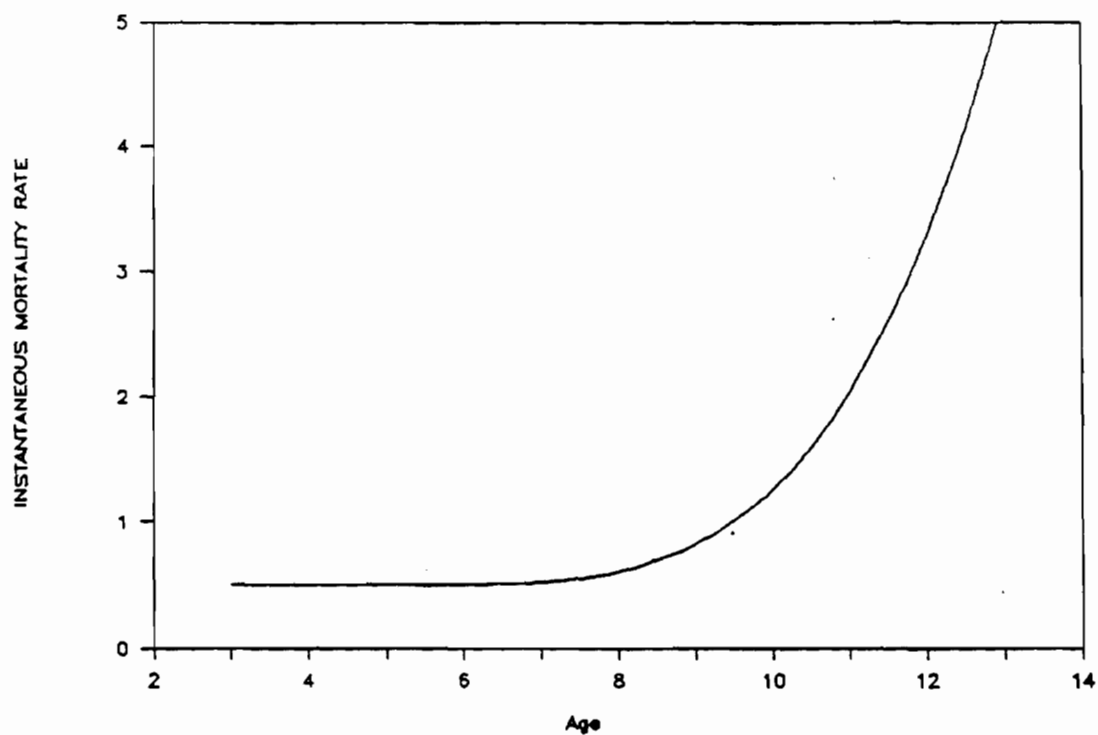


Figure 9. Instantaneous total mortality at age computed from the first derivative of the modified power function fit to the 1973-1987 Prince William Sound catch curve.

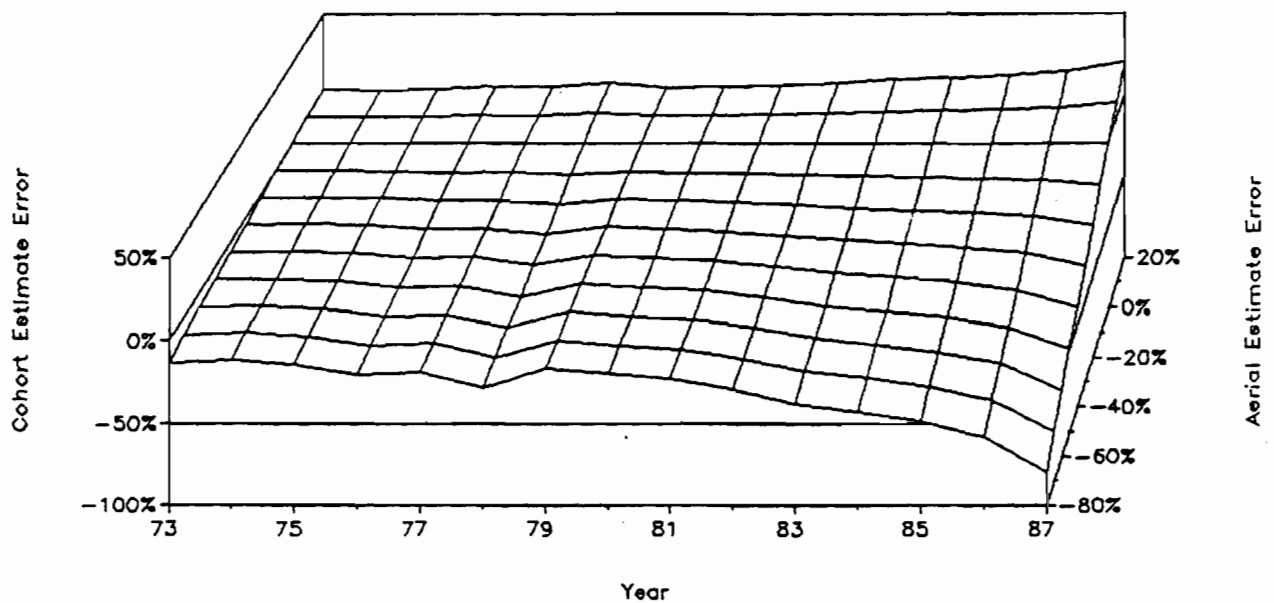


Figure 10. Sensitivity of Prince William Sound cohort analysis biomass estimates to errors in aerial survey estimates of terminal age cohort size, using an age-specific relative natural mortality schedule corresponding to an age-8 instantaneous natural mortality rate ( $M$ ) of 0.45.

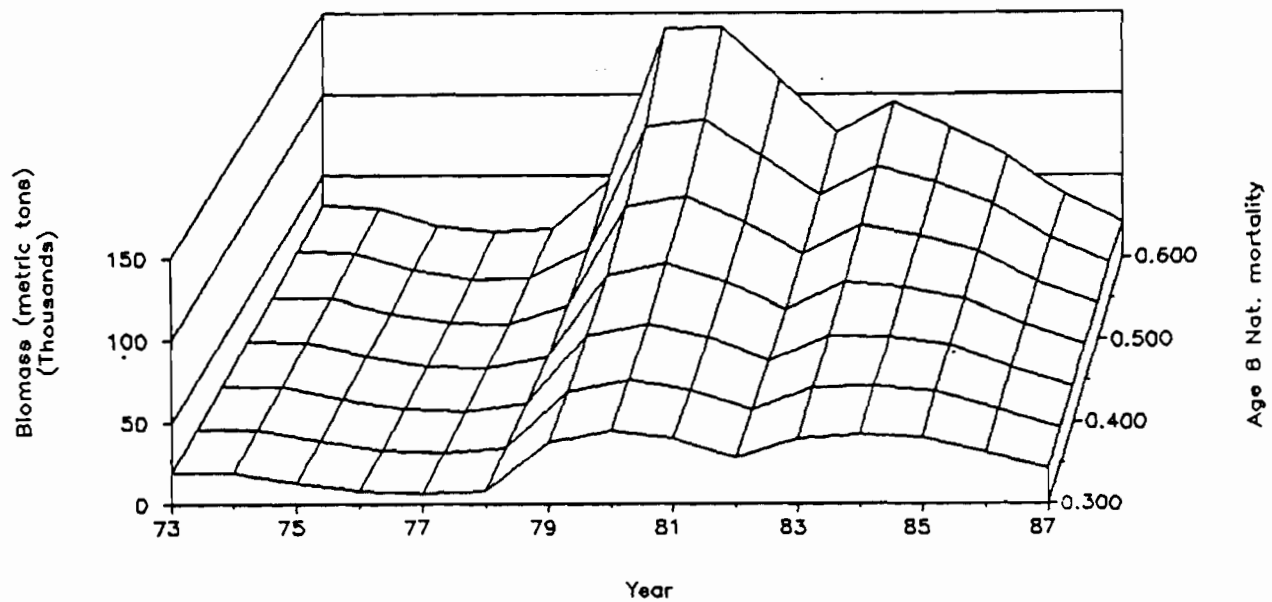


Figure 11. Sensitivity of Prince William Sound cohort analysis biomass estimates to changes in the assumed instantaneous rate of natural mortality, over the period 1973-1987, assuming no error in aerial survey biomass estimates.

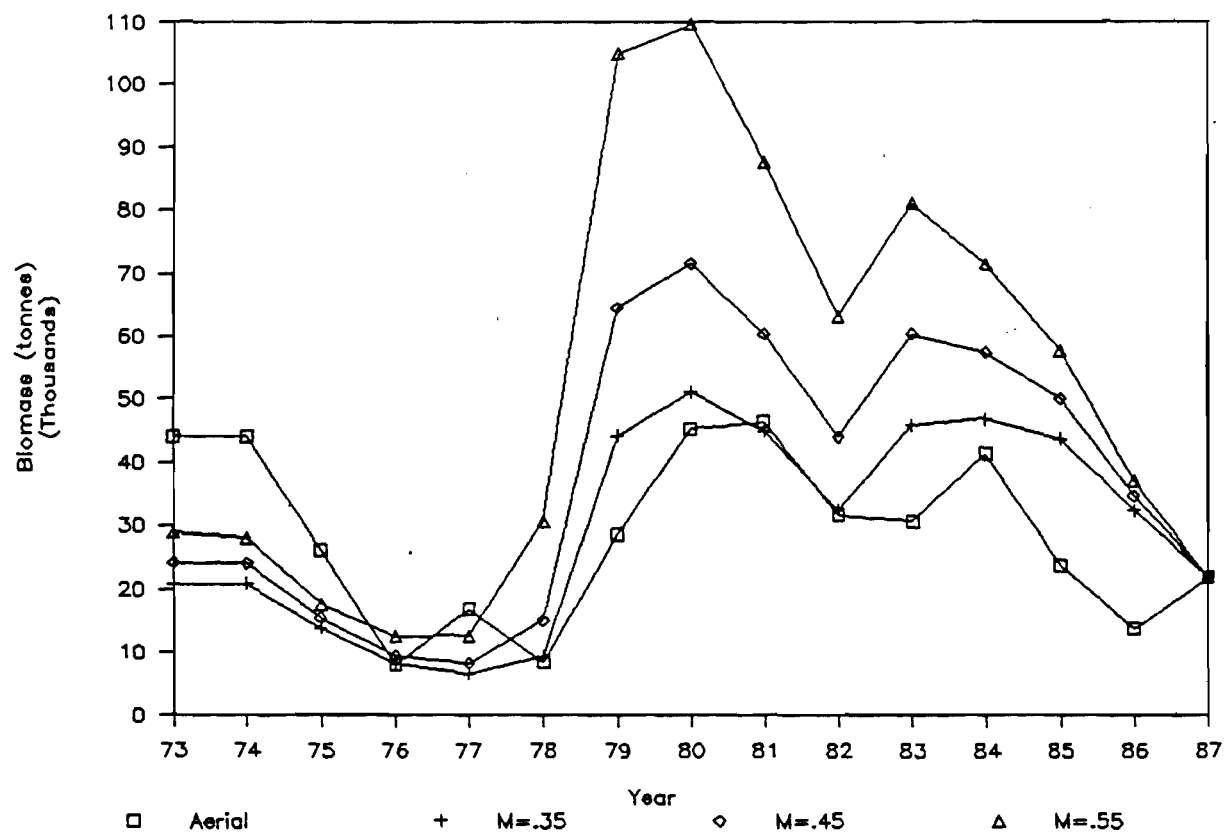


Figure 15. Comparison of Prince William Sound aerial survey estimates of biomass for 1973-1987 with cohort analysis biomass estimates, using age-specific instantaneous natural mortality schedules corresponding to age 8 instantaneous natural mortality rates of 0.35, 0.45, and 0.55.

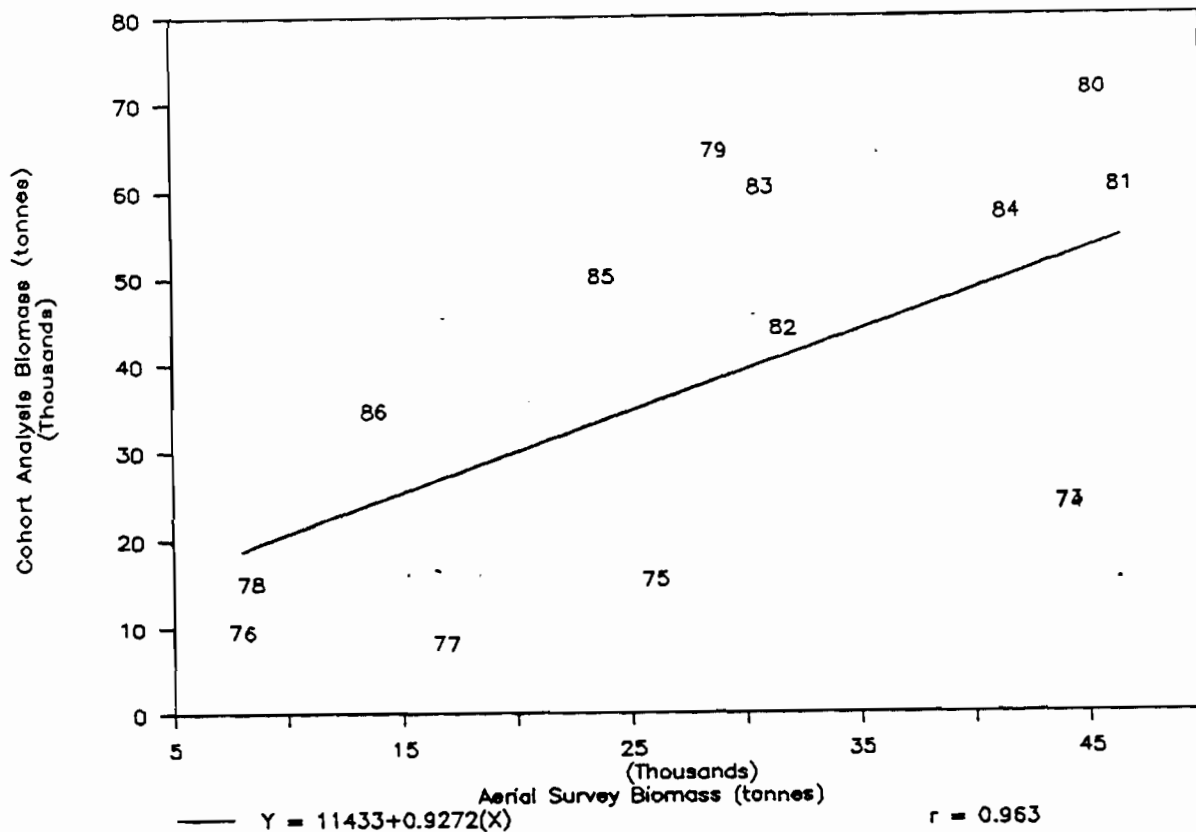


Figure 16. Relationship of Prince William Sound cohort analysis biomass estimates using an age-specific natural mortality schedule corresponding to age-8 natural mortality of 0.45 with corresponding aerial survey estimates for 1973-1986, and linear regression model.



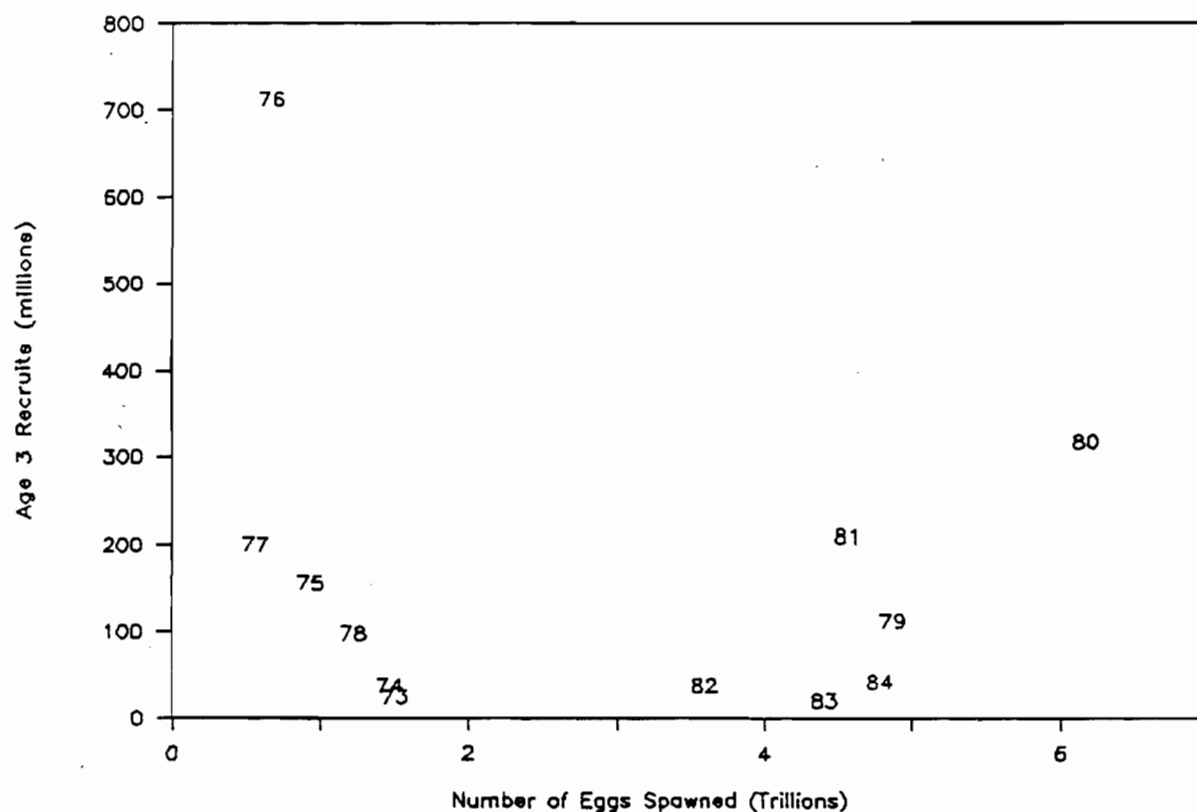


Figure 17. Relationship of age 3 recruits to the number of eggs deposited during the parent year for 1973-1984 year classes, using population numbers from cohort analysis for age-8 natural mortality ( $M$ ) = 0.45, and assuming no bias in aerial survey estimates of terminal cohort size. Year numbers indicate the year class of the age 3 recruits.

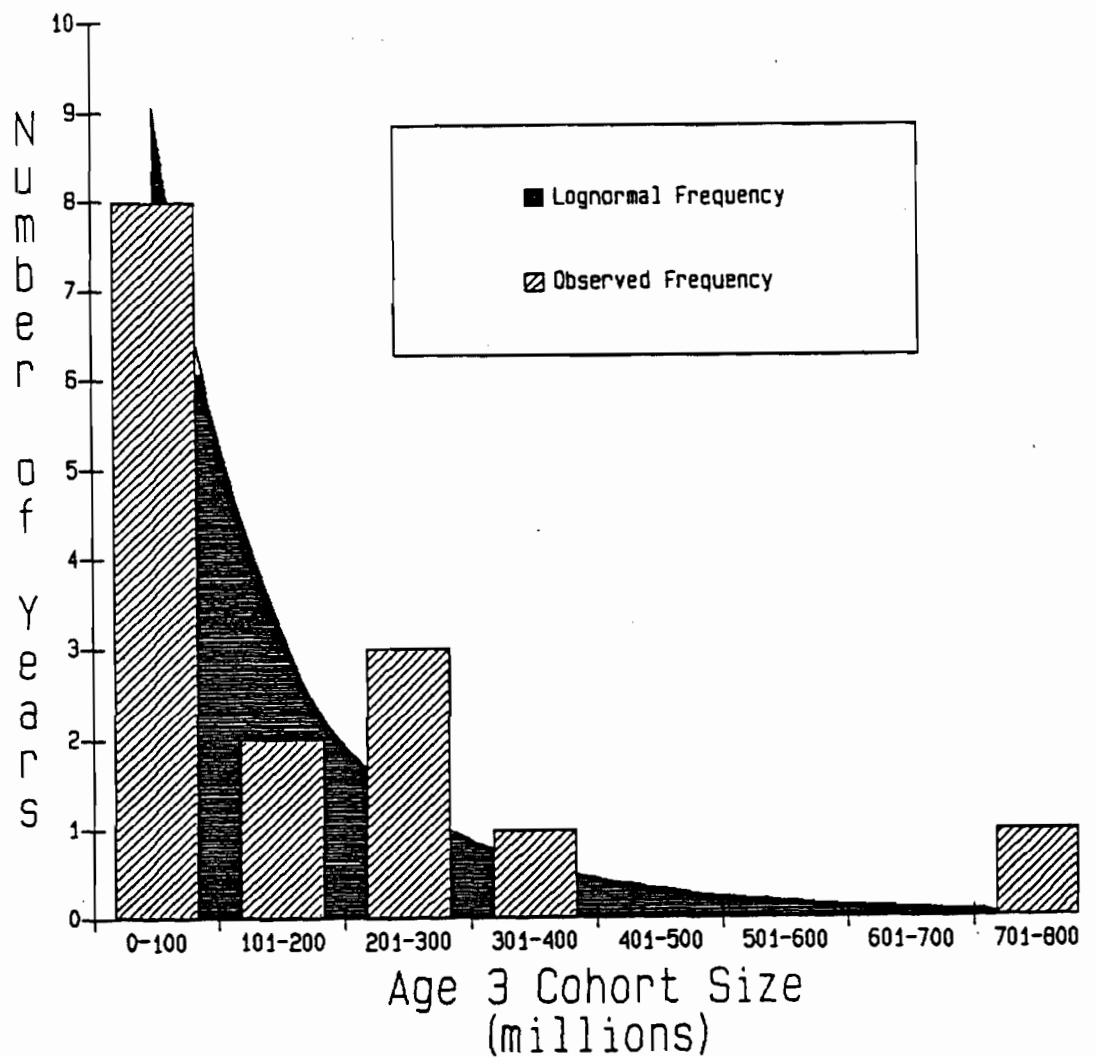


Figure 18. Frequency distribution of the size of 15 years of age 3 recruiting cohorts, based on cohort analysis results for age-8 natural mortality ( $M$ ) = 0.45 and assuming no bias in aerial survey estimates of terminal cohort size, and the lognormal distribution fitted to the age 3 cohort frequency distribution.

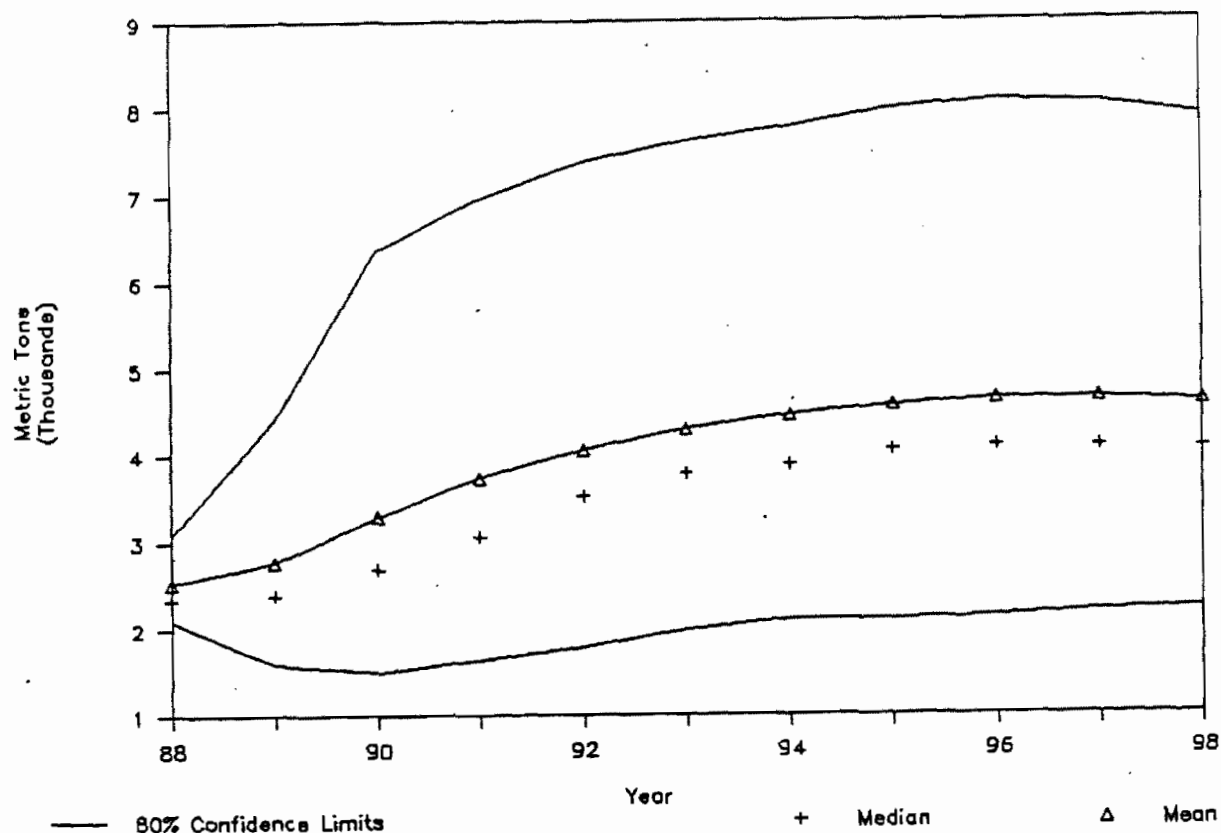


Figure 19. Projected harvests for 1988-1998 and bootstrap estimates of conditional 80% confidence intervals, assuming a 20% exploitation rate on the available biomass, age-8 natural mortality ( $M$ ) = 0.45, and future recruitments drawn from the observed 1973-1987 age 3 recruits determined from cohort analysis with age-8  $M$  = 0.45, and assuming no error in aerial survey biomass estimates.

Attachment 9

ALASKA DEPARTMENT OF FISH AND GAME  
DIVISION OF COMMERCIAL FISHERIES

PROJECT OPERATIONAL PLAN

Format

Title: PRINCE WILLIAM SOUND HERRING SPAWN DEPOSITION PROGRAM

Project Leader: Frederick M. Thompson

PCN: 1768

Date Submitted: September 3, 1987

Region: Central (R-II)

Fishery Unit: Prince William Sound Herring

Yellow Book Project No.: \_\_\_\_\_

Fiscal Year: FY-88

Total Project Cost: 40.9k  $\Rightarrow$  25K  
allocated for 1988

APPROVAL

Level	Signature	Date
Biometric:	_____	_____
Regional:	_____	_____
Divisional:	_____	_____

I. TITLE: Prince William Sound Herring Spawn Deposition Program

II. OBJECTIVES:

A. List the specific objectives beginning with the highest priority:

1.) Objective number one is to estimate the number of herring eggs at known spawning locations and by back-calculation estimate the spawning biomass of the Prince William Sound spring herring stock.

2.) Objective number two is to improve the accuracy and utility of the aerial survey herring biomass indices by comparing the aerial biomass estimates to the biomass estimates derived from the spawn deposition program.

B. To what Fisheries Management Operational Plans will this project contribute?

Species	Gear	Location
Herring	Purse Seine	Prince William Sound
Herring	Gill Net	Prince William Sound
Herring	Pounded Roe on Kelp	Prince William Sound
Herring	Wild Roe on Kelp	Prince William Sound

III. NEED OR PROBLEM ADDRESSED:

A. Describe the public and/or resource need addressed by the project and the project's benefits.

The spring herring population in Prince William Sound annually supports a multi-million dollar fishery. Purse seine, gillnet, wild roe on kelp, and pound fisheries contribute to the well being of both local and state economies. There are over 350 commercial fisheries limited entry permit holders and several processors providing a wide range of employment opportunities in the Prince William Sound area. The management of this fishery is based on a sliding scale exploitation rate of 0-20 percent of the harvestable biomass available. Currently, herring biomass estimates are derived from an aerial survey program. These estimates are complicated by several factors including weather conditions, variable depths of herring at time of survey which can result in extremely variable biomass estimates within short periods of time, variation in biomass estimates between observers with no means of calibrating estimates to a known biomass, and turbid water conditions caused by silt, wind turbulence, rain, or herring spawn. The current management strategy is, by necessity,

conservative. This is because of the inherent variability associated with the present method of biomass assessment. An alternative to the aerial index program will be accomplished through implementing a quantitative stock assessment program using herring spawn deposition, similar to the program utilized by regional ADF&G staff in southeast Alaska (Blankenbeckler and Larson, 1987). Feasibility studies conducted in Prince William Sound by Jackson and Randall (1983 and 1984) concluded that spawn deposition, as a method of estimating biomass, was more precise than aerial surveys which were estimates of peak visible biomass. The benefits of a intensive spawn deposition program will be: 1) an estimate of the spring herring spawning biomass based on quantitative population assessment, 2) enhancement of the aerial survey program by providing the necessary data to calibrate and verify aerial survey biomass estimates and correlate mile days of spawn to actual population estimates, 3) generate a more precise estimate of biomass for use in stock recruitment and cohort analysis models, 4) provide a quantitative basis for development, evaluation and improvement of harvest objectives and target exploitation rates and, 5) provide an improved data base for management decisions which enhances the Departments position when interacting with user groups.

#### B. How will the success of the project be judged?

The project success is ultimately determined by the completion of a statistically valid estimate of the spring spawning biomass in Prince William Sound. Success may be further evaluated by comparison of spawn deposition biomass estimates to biomass estimates from cohort analysis, stock-recruitment, and aerial survey program. Although veracity is difficult, a comparative treatment of the spawn deposition results is the logical first step.

#### IV. A. Location:

The project will be confined to the waters of Prince William Sound. Actual field operations will occur in areas of herring spawn located by the aerial survey program.

#### B. Field Program Duration:

It is anticipated that the field portion of the project will last about six weeks, from mid-April until the end of May.

#### C. Sampling Duration If Different Than Above:

Same

#### D. Frequency Of Sampling While In The Field:

Sampling areas of herring spawn will occur daily while in the field. The exceptions would be travel days and days in which weather prevented sampling. Four project divers can potentially sample five miles of spawn per day.

E. Longevity Of The Project:    ☐ 1 year,        ☐ 2 years,  
   ☐ 3 years,        ☒ continuing

F. Is this project new?    ☐ Yes, ☒ No

## V. DATA COLLECTION:

### A. Types of Data Collected:

- 1.age, length, weight,and sex ratio information
- 2.location, length, width, depth, and duration of spawn
- 3.spawn substrate
- 4.herring fecundity
- 5.number of herring eggs per sample quadrant (1\*10th square meter)
- 6.calibration samples

### B. Sample Collection Methods:

- ### 1. Age, length, weight, and sex ratio information

Age, length, weight, and sex ratio information will be obtained from herring samples collected by beach seine and from the commercial purse seine catch. Samples will be placed in storage bags and returned to Cordova where sex, length, and weight will be determined. A scale from each specimen will be placed on a microscope slide and aged on a time available basis.

- ## 2. Location, length, width, and duration of spawn

Areas of the shoreline receiving herring spawn will be identified in conjunction with routine aerial surveys conducted for management of the herring sac roe fishery. Once areas of spawn have been located a crew of four divers will determine the length, width and depth of spawn. Sampling will be conducted along transects positioned perpendicular to the shoreline and spaced at 1/3 to 1/2 mile intervals for the entire length of the spawn. Each transect will be sampled in the following manner:

- 1.) Project divers (working in two crews of two) determine a compass course that is perpendicular to the shoreline.

2.) Beginning inshore and moving offshore along the pre-selected compass course, divers will estimate egg densities in a 1\*10th square meter (m) sample quadrant positioned randomly at five meter intervals. Sampling will continue along the transect until eggs are no longer observed. Additionally, divers will collect three grab samples each fifth transect. If possible, each of the grab samples will be taken from a

different substrate type. The samples will be counted and compared to diver estimates with the results providing a calibration factor to adjust egg density estimates.

3.) Divers will record the depth and substrate type associated with each sample quadrant. Meteorologic conditions such as air and water temperatures, stage of tide, and wind direction and speed will be recorded prior to each dive.

### 3. Spawn substrate

Critical to the precision of the biomass estimate is the collection of spawn substrate data. The literature suggests considerable variability in egg coverage and retention between substrate types. For this reason, accurate records will be maintained for all samples collected.

### 4. Herring fecundity

1.) Population length frequency histograms will be produced from commercial catch and escapement samples.

2.) The range of lengths will be separated into 10 mm intervals.

3.) Ten females from each length group will be sampled for fecundity. Whole egg skeins will be frozen and analyzed following the field season. The procedure will be as follows: a) eggs from each female will be weighed to the nearest .01 gram (g), b) a subsample of 0.5 to 1.0 g shall be removed randomly from each female, weighed to the nearest .01 g and preserved in Gilson's solution, c) all eggs in the subsample will be individually counted and, d) fecundity calculated by simple proportion.

### 5. Number of herring eggs per sample quadrant (1\*10th square meter)

Divers will estimate egg densities within each sample quadrant following the methods of Jackson and Randall (1984). In their study egg densities were estimated using a unit concept where one unit was defined as one layer of eggs in a 1\*10th square meter (no spaces between eggs) or 40,000 eggs.

### 6. Calibration samples

Egg density estimates will be calibrated by extracting and counting the eggs from three 1\*10th square meter sampling quadrants every fifth transect. If possible, samples will be collected from different substrate types. The number of eggs estimated in the field will be compared to the actual number of eggs to develop a correction factor for each substrate type.

## VI. DATA ANALYSIS:

A. What determines how many samples (observations) of each data type will be taken?



Sample sizes to establish population age structure and other meristic information will be determined based on guidelines developed by ADF&G, Com. Fish. Div. biometricians. Number of transects per unit area of spawn will be determined by the spawning habitat variability. Similar habitat types in an area of spawn will be sampled with less intensity than areas with more variable habitat types.

B. What types of statistics are computed?

Parameters of linear regression analysis.

F statistic

Point estimate of number of eggs.

C. What types of statistical tests are applied?

Regression analysis

Analysis of variance

Biomass estimate

D. What questions will each test help you evaluate?

Regressing fecundity as a function of length is necessary to establish a predictive relationship.

Analyses of the variances from pooled transect data and transect data stratified by vegetative type will provide insight on sampling strategies and precision of the estimated number of eggs per sampling location.

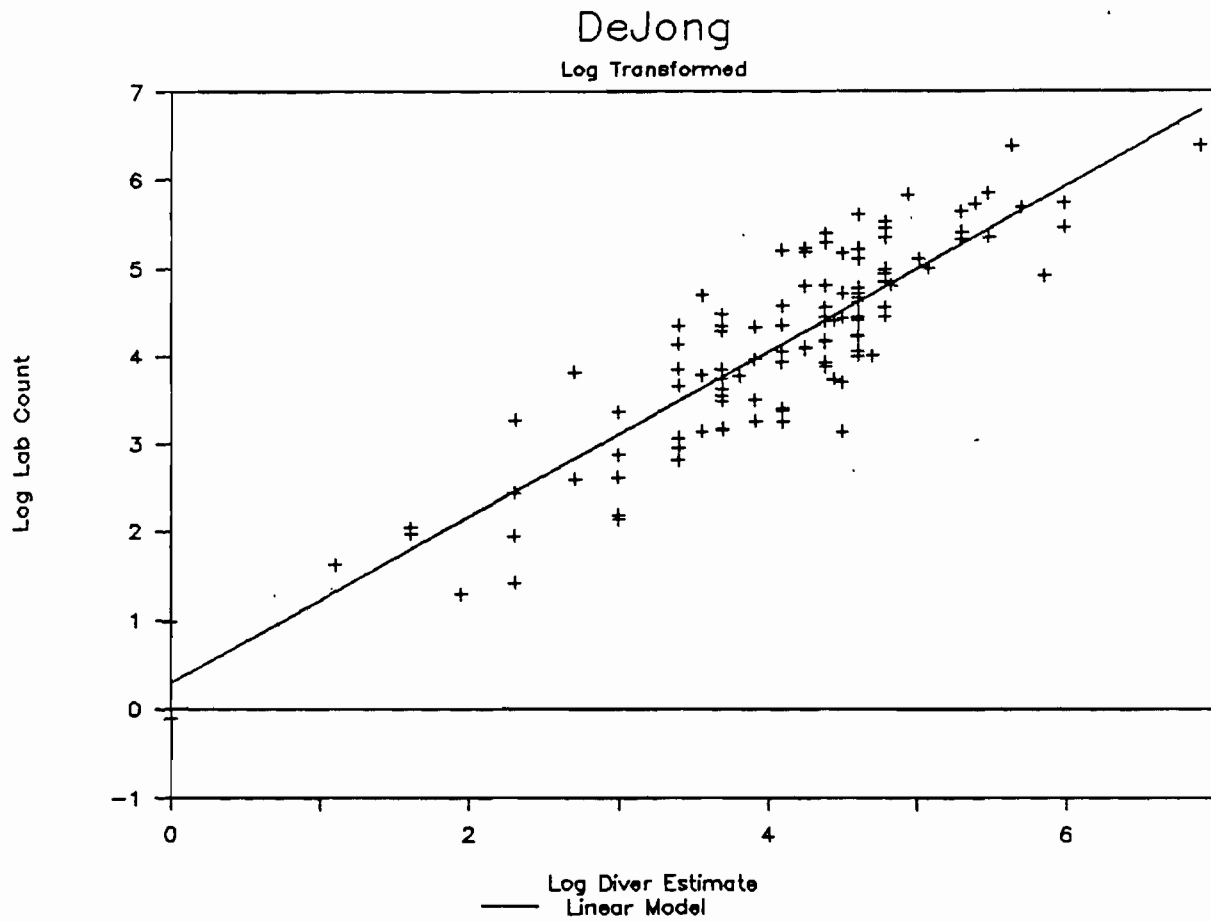
Total escapement in pounds of herring is calculated for each sampling area as follows:

$$E = \frac{A \times D}{F} \times C \times W \times P$$

where: E - escapement (millions of pounds)  
A - area (square meters)  
D - density average (eggs per square meter squared)  
F - average fecundity  
C - sex ratio  
W - average weight (pounds)  
P - egg loss factor

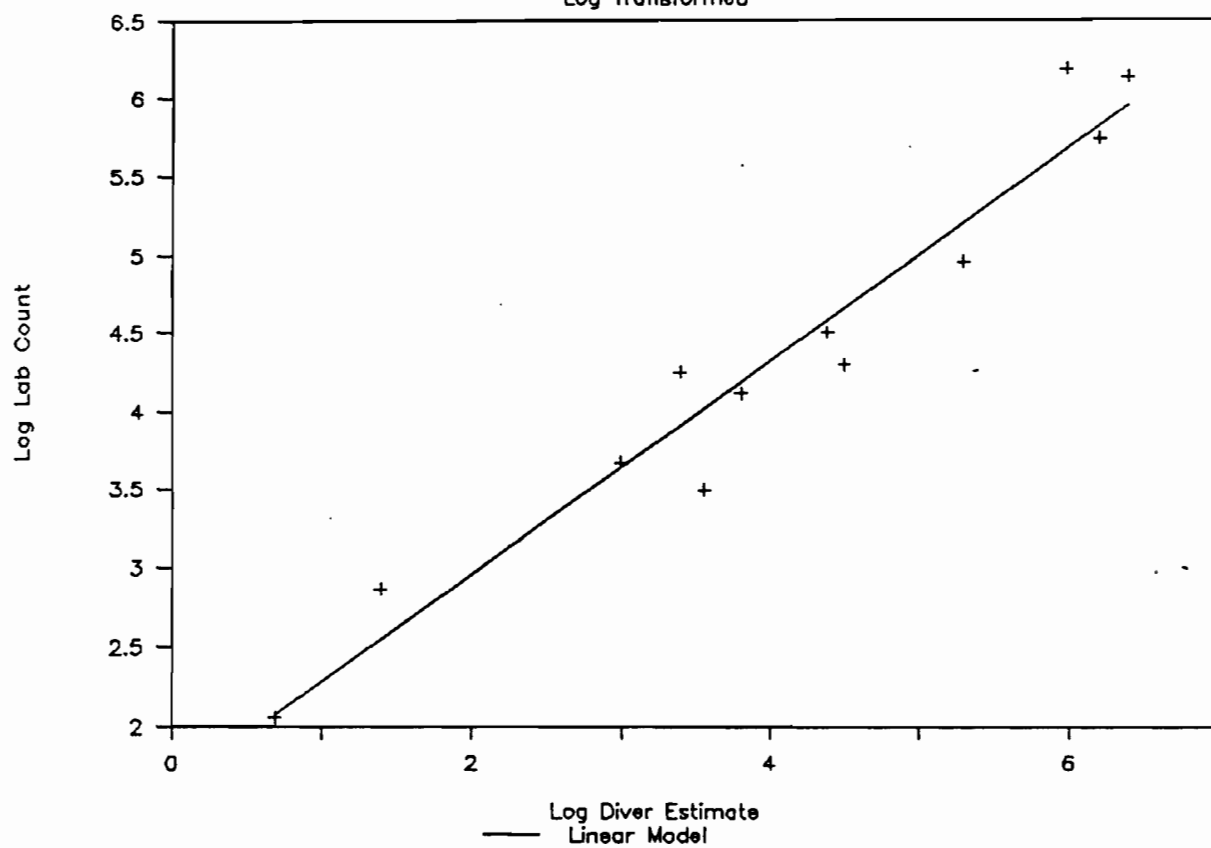
E. Where, how, when, and with what hardware and software will these analyses be conducted?

Analyses will be conducted in the Cordova field office between mid-May and June 30th. Raw data will be entered into a Lotus spreadsheet by a



M. Jackson

Log Transformed



2/18/88

Attachment 11

PRINCE WILLIAM SOUND  
COMMERCIAL PACIFIC HERRING HARVEST SUMMARY,  
DATA PRESENTATION AND ANALYSIS 1984-1987.

By

Gene J. Sandone,

Samuel Sharr

and

James A. Bradey

D R A F T

Technical Fishery Report No. \_\_\_\_  
of the  
Alaska Department of Fish and Game  
Division of Commercial Fisheries  
Juneau, Alaska

February 12, 1988

## CONCLUSIONS

1. Either the herring biomass which contributes to the Prince William Sound fall and winter bait/food fishery is a separate stock or sub stock of the Prince William Sound herring spawning biomass, or the fishermen participating in the bait/food fishery were extremely selective in their catch of herring by size. However, in order to conservatively manage the resource, the herring biomass which contributes to the fall and winter bait/food fishery should be treated as a separate stock. A study designed to ultimately answer the status of this biomass should be initiated. Initially, however, a estimate of the fall/winter herring biomass should be attempted in order that harvest levels can be adjusted.
2. The gill net sac-roë fishery selects for larger, and therefore older, individuals of the herring biomass as well as for larger individuals of the younger age class (ages 3 - 6 or 7). Significant recruitment to the gill net sac-roë fishery occurs no earlier than age 5.
3. Younger-aged herring arrive on the spawning ground later than older individuals. Smaller herring at age arrive later on the spawning grounds than their larger siblings.

*basic  
mean length diff  
age class diff*

4. Specific location of a fishery may also play an important role in determining the age-class composition of the harvest. . In 1986, ADF&G herring samples taken from eastern Prince William Sound appeared to contain more individuals of the younger age classes than samples taken from north shore harvests. However, one year of data hardly represents a trend. Therefore, in order to ascertain where this observed phenomena is actually occurring, a study designed to determine the spatial segregation of herring by age within Prince William Sound should be initiated. Results of such a study would aid managers in targeting specific age groups for harvest or escapement.
  
5. Proportion of male herring in the pre-spawning biomass increased with time relative to initiation of the annual sac-roe fishery. This relationship between male dominance of the biomass versus time becomes more apparent when recruitment of 3-year old herring to the spawning biomass is substantial. The management implications of such a relationship are great since the major products of the spring sac-roe fisheries are based upon female herring.

Table 1. Proposed samples for scales, sexes, and lengths from sockeye salmon in the Cooper/Bering River Area commercial catches, 1988.

District(s)	Location	Gear	Suggested Strata		Suggested Sample Period		Sample Size	
			Week(s)	Dates	Week	Dates	Stratum	Total
200	Bering River (Inside)	Drift Gillnet	26	6/19 - 6/25	26	6/20 - 6/21	610	1220
			27-28	6/26 - 7/09	27	7/01 - 7/02	610	
212	Cooper River	Drift Gillnet	21	5/15 - 5/21	21	5/16 - 5/17	610	4800
			22	5/22 - 5/28	22	5/23 - 5/24	610	
			23	5/29 - 6/04	23	5/30 - 5/31	610	
			24	6/05 - 6/11	24	6/06 - 6/07	610	
			25	6/12 - 6/18	25	6/13 - 6/14	610	
			26-27	6/19 - 7/02	26	6/24 - 6/25	1/ 610	
			28-29	7/03 - 7/16	29	7/11 - 7/12	610	
			30-35	7/17 - 8/27	31	7/29 - 7/30	2/ 610	

1/ The alternate dates for this sample are 6/27-6/28.

2/ This sample will be taken earlier if the commercial catch drops sharply before these dates.

1/  
Table 2. Proposed samples for scales, sexes, and lengths from chinook salmon in the Cooper/Bering River Area commercial catches, 1988.

District	Location	Gear	Suggested Strata		Suggested Sample Period 2/		Sample Size	
			Week(s)	Dates	Week	Dates	Stratum	Total
212	Cooper River	Drift Gillnet	21-22	5/15 - 5/24	21	5/16 - 5/17	675	2025
			22-23	5/25 - 6/04	22	5/27 - 5/28	675	
			24-25	6/05 - 6/15	24	6/10 - 6/11	675	

1/ ADF&G Sport Fish Division have collected chinook salmon carcass samples from the Upper Cooper River drainage annually since 1986. These samples will also be collected in 1988 to provide addition age and stock composition data on upriver chinook salmon stocks.

2/ Another sampling scheme that could be considered would be to take a total of four samples and collect one sample from each of the following Statistical Weeks: 21, 22, 23, and 25.



Table 3. Proposed samples for scales, sexes, and lengths from coho salmon in the Cooper/Bering River Area commercial catches, 1988.

District(s)	Location	Gear	Suggested Strata		Suggested Sample Period		Sample Size	
			Week(s)	Dates	Week	Dates	Stratum	Total
200	Bering River	Drift Gillnet	33-35	8/07 - 8/27	35	8/24 - 8/25	600	1200
			36-40	8/28 - 10/01	38	9/13 - 9/14	600	
212	Cooper River 1/	Drift Gillnet	32-34	8/01 - 8/17	33	8/10 - 8/11	600	1800
			34-36	8/18 - 8/31	35	8/24 - 8/25	600	
			36-40	9/01 - 10/01	37	9/06 - 9/07	600	

1/ What we have tried to do for the proposed Cooper River coho sampling scheme for 1988 is to pool the first two samples that we have traditionally made on the smaller front end of the run and shift the later samples back to characterize the peak and the tail end of the run. The parent years for the 1988 coho salmon run on the Cooper River are expected to be 1984 (Age 1.1) and 1985 (Age 2.1).

Table 4. Proposed samples for scales, sexes, and lengths from sockeye salmon in Prince William Sound commercial catches, 1988.

District(s)	Location	Gear	Suggested Strata		Suggested Sample Period		Sample Size		
			Week(s)	Dates	Week	Dates	Stratum	Total	
222-50	Unakwik	1/	Drift Gillnet	26-27	6/19 - 7/02	27	6/26 - 6/27	610	1220
				28-29	7/03 - 7/16	29	7/11 - 7/12	610	
223	Coghill	2/	Drift Gillnet	26-27	6/19 - 7/02	26	6/23 - 6/24	610	1830
				28-29	7/03 - 7/16	28	7/07 - 7/08	610	
				30-31	7/17 - 7/30	30	7/21 - 7/22	610	
225	Eshamy	3/	Set + Drift Gillnet	30-31	7/17 - 7/30	30	7/21 - 7/22	610	1830
				32-33	7/31 - 8/13	33	8/04 - 8/05	610	
				34-35	8/14 - 8/27	34	8/18 - 8/19	610	
226	Southwestern	4/	Purse Seine	30-31	7/17 - 7/30	30	7/18 - 7/19	610	1830
				32-33	7/31 - 8/13	32	8/02 - 8/03	610	
				34-36	8/14 - 9/03	34	8/15 - 8/16	610	

- 1/ There are primarily two sockeye stocks that return to spawn in the Unakwik Subdistrict, one returns to Miners Lake and the other to Cowden Lake.
- 2/ This sampling scheme for Coghill sockeye is designed to characterize the early, middle, and late part of the run. A second option would be to drop back to a two strata sampling scheme for Coghill, however we would prefer to stick with three sampling strata.
- 3/ The last year that there was a large catch of sockeye salmon in the Eshamy district was 1984. Recently this district has been producing it's largest runs once every fourth year, therefore we expect a fishery in this district in 1988. The sampling scheme presented for Eshamy is designed to characterize the early, middle, and late part of the sockeye run. A second option would be to use a two strata sample that would characterize the early (Stat Week 31) and late (Stat Week 34) part of the run. This may be a viable alternative since the parent year (1984) sample showed no significant changes in age composition in the first four strata sampled.
- 4/ Do we need to continue weekly sockeye samples from the Southwestern district to document the suspected intercession of early run (Coghill bound) and late run (Eshamy bound) sockeye for future Eshamy district controversies posed to the Board of Fisheries? If this is no longer a burning issue, we would like to cut this sample back to three strata that would be designed to characterize the early, middle, and late part of the run in the Southwestern district. Weekly samples of sockeye can be continued if this data is needed, however this is a very time and labor intensive sample to obtain.

Table 5. Proposed samples for scales, sexes, and lengths from chum salmon in Prince William Sound commercial catches, 1988.

District(s)	Location	Gear	Suggested Strata		Suggested Sample Period		Sample Size		
			Week(s)	Dates	Week	Dates	Stratum	Total	
221	Eastern	1/	Purse Seine	28-29	7/03 - 7/16	28	7/05 - 7/06	400	1600
				30-31	7/17 - 7/30	30	7/19 - 7/20	400	
				32-33	7/31 - 8/13	32	8/02 - 8/03	400	
				34-36	8/14 - 9/03	34	8/16 - 8/17	400	
222	Northern	2/	Purse Seine	29	7/10 - 7/16	29	7/12 - 7/13	400	1200
				30-31	7/17 - 7/30	30	7/19 - 7/20	400	
				32-34	7/31 - 8/20	33	8/08 - 8/09	400	
223	Cophill		Drift Gillnet	26-27	6/19 - 7/02	26	6/21 - 6/22	400	800
			Purse Seine	28-31	7/03 - 7/30	29	7/12 - 7/13	400	
224	Northwestern	3/	Purse Seine	28-30	7/03 - 7/23	29	7/12 - 7/13	400	800
				31-34	7/24 - 8/20	32	8/03 - 8/04	400	
225	Eshamy	4/	Drift and Set Gillnets	26-27	6/19 - 7/02	26	6/22 - 6/23	400	1200
				28-29	7/03 - 7/16	28	7/06 - 7/07	400	
				30-35	7/17 - 8/27	32	8/03 - 8/04	400	
226	Southwestern	4/	Purse Seine	30-31	7/17 - 7/30	30	7/19 - 7/20	400	1200
				32-33	7/31 - 8/13	32	8/02 - 8/03	400	
				34-35	8/14 - 8/27	34	8/16 - 8/17	400	
228	Southeastern	4/	Purse Seine	30	7/17 - 7/23	30	7/19 - 7/20	400	1200
				31-32	7/24 - 8/06	31	7/26 - 7/27	400	
				33-35	8/07 - 8/27	33	8/09 - 8/10	400	

- 1/ The Eastern district is one of the bigger chum salmon producers in PWS and because age composition is the only forecasting tool for chums in this district. Since the 1988 chum run in this district should be similar to the bimodal run that was documented in 1984, we feel that a four strata (2 early and 2 late) sampling scheme would be desirable this year.
- 2/ The sampling scheme for the Northern district is designed to characterize the early, middle, and later part of the run.
- 3/ In recent years the chum fishery in the Northwestern district has occurred from mid-July to mid-August and no dramatic shifts in age composition have been observed during this time. Therefore we feel that a two strata sample would be sufficient.
- 4/ The sampling scheme for these district is designed to characterize the early, middle, and later part of the run.

Table 6. Processed samples for scales, sexes, and lengths from coho salmon in Prince William Sound commercial catches, 1988.

District(s)	Location	Gear	Suggested Strata		Suggested Sample Period		Sample Size	
			Week(s)	Dates	Week	Dates	Stratum	Total
221-228	General Districts	Purse Seine	27-35	6/28 - 8/29	As Available 1/		As Available 1/	

1/ Tenders from Valdez Arm and Cognill will be targeted for this sample.

Table 7. Proposed samples for sex ratios in pink salmon catches in Prince William Sound purse seine fishery, 1988.

District(s)	District	Discrete Sampling Locations	Suggested Strata		Suggested Sample Period		Sample Size 1/	
			Week(s)	Dates	Week	Dates	Stratum	Total
221	Eastern	Fidalgo & Gravina Bays	27-28	6/28 - 7/11	28	7/06-7/07 & 7/10-7/11	300	600
			29	7/12 - 7/18	29	7/13-7/14 & 7/17-7/18	300	600
			30	7/19 - 7/25	30	7/20-7/21 & 7/24-7/25	300	600
			31	7/26 - 8/01	31	7/27-7/28 & 7/31-8/01	300	600
			32	8/02 - 8/08	32	8/03-8/04 & 8/07-8/08	300	600
222	Northern	Unakwik Inlet	33-35	8/09 - 8/29	33	8/10-8/11 & 8/14-8/15	300	600
			27-28	6/28 - 7/11	28	7/06-7/07 & 7/10-7/11	300	600
			29	7/12 - 7/18	29	7/13-7/14 & 7/17-7/18	300	600
			30	7/19 - 7/25	30	7/20-7/21 & 7/24-7/25	300	600
			31-35	7/26 - 8/29	31	7/26-7/27 & 7/31-8/01	300	600
224	Northwestern	Shiowayd	29	7/12 - 7/18	29	7/13-7/14 & 7/17-7/18	300	600
			30	7/19 - 7/25	30	7/20-7/21 & 7/24-7/25	300	600
			31	7/26 - 8/01	31	7/27-7/28 & 7/31-8/01	300	600
			32	8/02 - 8/08	32	8/03-8/04 & 8/07-8/08	300	600
			33-35	8/09 - 8/29	33	8/10-8/11 & 8/14-8/15	300	600
226	Southwestern	Eirington	27-28	6/28 - 7/11	28	7/06-7/07 & 7/10-7/11	300	600
			29	7/12 - 7/18	29	7/13-7/14 & 7/17-7/18	300	600
			30	7/19 - 7/25	30	7/20-7/21 & 7/24-7/25	300	600
			31	7/26 - 8/01	31	7/27-7/28 & 7/31-8/01	300	600
			32	8/02 - 8/08	32	8/03-8/04 & 8/07-8/08	300	600
228	Southeastern	Purse Seine	33-35	8/09 - 8/29	33	8/10-8/11 & 8/14-8/15	300	600
			29	7/12 - 7/18	29	7/13-7/14 & 7/17-7/18	300	600
			30	7/19 - 7/25	30	7/20-7/21 & 7/24-7/25	300	600
			31	7/26 - 8/01	31	7/27-7/28 & 7/31-8/01	300	600
			32	8/02 - 8/08	32	8/03-8/04 & 8/07-8/08	300	600

1/ Biweekly sample from each designated sampling location.

Editors Notes: Since no manpower or funds have been allocated for this proposed study it will receive low priority in 1988.

Should we also consider devising a sampling scheme for obtaining mean weights of pink salmon at various intervals throughout the 1988 commercial fishing season? If so, should these samples be district specific and how often should the samples be repeated? We feel that there may be a need for some additional average weight data for pinks to make sure that the pink salmon catches are being reported accurately. However we can not collect these data with existing staff unless additional overtime hours are funded.

Table 8. Proposed samples for scales, sexes, and lengths from sockeye salmon catches in the Upper Cooper River subsistence and personal use fisheries, 1988.

District	Location	Gear	Suggested Strata Dates	Suggested Sample Dates	Suggested Strata Sample Sizes
212	Upper Cooper River: (Chitina to Slana)	Dipnet and Fishwheel	5/31 - 6/06	5/31 - 6/02	400-600
			6/07 - 6/13	6/07 - 6/09	400-600
			6/14 - 6/20	6/14 - 6/16	400-600
			6/21 - 6/27	6/21 - 6/23	400-600
			6/28 - 7/04	6/28 - 6/30	400-600
			7/05 - 7/11	7/04 - 7/07	400-600
			7/12 - 9/30	As Available	400-600

Table 9. Proposed samples for scales, sexes, and lengths from sockeye salmon catches in the Cooper River Delta and Bering River escapements, 1988.

Drainage	Spawning Area	Approximate Timing for the Escapement	Sampling Method	Suggested Time Period for Attempting Sample	Suggested Sample Size
Eyak River	Eyak Lake - South Beaches	Early July to Mid-August	Beach Seine Carcasses	7/10 - 7/20 August	600-800 As Available
	Eyak Lake - Middle Arm 1/	Early June and Late August	Beach Seine Carcasses	8/10 - 8/20 As Available	400+ As Available
	Eyak Lake - North Beaches 1/	Late July to Mid-August	Beach Seine Carcasses	As Available As Available	As Available As Available
	Eyak Lake - Hatchery Creek	Late June to Mid-July	Beach Seine Carcasses	6/25 - 7/04 As Available	400+ 300+
Alaganik Slough	McKinley Lake	Early July to Mid-August	Beach Seine	7/10 - 7/20	600-800
27-Mile Slough	27-Mile Slough	Late June to Late July	Beach Seine	6/18 - 6/25	600-800
Martin River	Ragged Point Lake	Early to late August	Beach Seine	8/01 - 8/07	600-800
	Martin Lake	Mid June to Mid-August	Beach Seine	7/14 - 7/21	600-800
	Little Martin Lake	Mid-Jul to Mid-August	Beach Seine	7/24 - 7/31	600-800
	Tokun Lake	Early August	Beach Seine	8/07 - 8/14	600-800
Martin River Slough	Martin River Slough	Late June to Mid-August	Beach Seine	6/25 - 7/02	600-800
39-Mile Creek	39-Mile Creek	Mid-July to Mid-August	Beach Seine	7/14 - 7/21	600-800

Continued

Table 9 (Continued). Proposed samples for scales, sexes, and lengths from sockeye salmon catches in the Cooper River Delta and Bering River escapements, 1988.

Drainage	Spawning Area	Approximate Timing for the Escapement	Sampling Method	Suggested Time Period for Attempting Sample	Suggested Sample Size
Bering River	Bering Lake / Dick Creek	Late June to Mid-August	Beach Seine	7/03 - 7/14	600-800
	Shepherd Creek	Mid-June to Mid-August	Beach Seine	6/24 - 6/30	600-800
	Kushtaka Lake	Mid-July to Mid-August	Beach Seine	7/23 - 7/30	600-800



Table 10. Proposed samples for scales, sexes, and lengths from sockeye salmon escapements to spawning areas in the Upper Copper River drainage, 1988.

Drainage	Spawning Area	Approximate Timing for the Escapement	Sampling Method	Suggested Time Period for Attempting Sample	Suggested Sample Size
Upper Copper River	Long Lake	7/23 - 9/23	Weir	9/01 - 9/07	675

Table 11. Proposed scale, sex, and length samples for sockeye escapements through Coghill and Eshamy weirs, 1988.

Escapement	Expected Duration of Escapement	Suggested Sample Strata	Suggested Sample Dates	Suggested Sample Size
Coghill Weir	6/15 - 7/30	6/15 - 6/30	6/22 - 6/24	675
		7/01 - 7/09	7/03 - 7/05	675
		7/10 - 7/30	7/14 - 7/18	675
Eshamy Weir	7/07 - 9/05	7/07 - 7/31	7/16 - 7/20	675
		8/01 - 8/21	8/09 - 8/13	675
		8/22 - 9/05	8/26 - 8/29	675

Table 12. Personnel distribution for herring and salmon sampling, data analysis, and reporting responsibilities in the CBR/PWS area, 1988.

Project	FB II Proj. Leader	FB I Ass. Proj. Leader 1909	FT I Sampler 1515	FT I Sampler 1527	FT I Sampler 1658	2 - CI IV Interns ?
PWS Herring:						
AWL Sampling	X		X			
Data Analysis	X					
Data Reporting	X					
CBR Salmon:						
AWL Sampling						
Commercial Catch	X	X	X	X	X	X
Subsistence Catch			X			
Escapement	X		X	X	X	X
CWT Sampling	X	X	X	X	X	X
CWT Data Editing & Processing		X				
AWL Data Analysis	X					X
AWL Data Reporting	X					
Inseason Stock Allocation	X					X
Post Season Stock Allocation	X					
Stock Allocation Reporting	X					
PWS Salmon:						
AWL Sampling						
Catch	X		X	X	X	X
Escapement	X		X	X	X	X
Pink Sex Ratio Sampling	X		X	X	X	X
CWT Sampling	X		X	X	X	X
CWT Data Editing & Processing		X				
AWL Data Analysis	X					X
AWL Data Reporting	X					
Sex Ratio Data Analysis	X					
Sex Ratio Data Reporting	X					

Editors Note: Since the FB I Assistant Project Leader's primary duties have been shifted to the CBR and PWS coded wire tag programs, we find ourselves short one man for catch and escapement AWL sampling. If the funds were available, it would be very beneficial to add an FT II or FT III to the AWL sampling crew. This individual could serve as an onsite crewleader that would direct the activities of AWL sampling crew in the fish processing facilities or at remote escapement sampling sites. The addition of this position would allow the FB II Project Leader more time to concentrate on on scheduling crew activities; proofing, editing, and processing AWL data in a timely manner; and possibly give him time to complete other reporting duties.

Table 13. Time tables for projects and personnel in herring and salmon sampling, data analysis, and reporting programs in CBR/PWS, 1988.

Project	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Seo	Oct	Nov	Dec
PWS Herring												
AWL Sampling												
Bait/Food										XXXXXXXX		
PS/GN				XXXXXXXX								
Found				XXXXXXXXXXXX							XXXX	
Data Analysis				XXXXXXXXXXXX								XXXX
Data Reporting	xxx											
CBR Salmon												
AWL Sampling												
Commercial Catch												
Sockeye					XXXXXXXXXXXXXXXXXXXX							
Chinook					XXXXXXX							
Coho								XXXXXXXXXXXX				
Subsistence Catch												
Sockeye						-----1/-----						
Escapement												
Sockeye						XXXXXXXXXXXXXXXXXXXX						
CWT Sampling (sockeye)						XXXXXXXXXXXXXXXXXXXX						
AWL Data Analysis						XXXXXXXXXXXXXXXXXXXX						
AWL Data Reporting	XXXXXXXXXXXX											
Inseason Stock Allocation						XXXXXXX						
Post Season Stock Allocation	XXXXXXXXXXXXXXXXXXXX										XXXXXXXXXXXX	
Stock Allocation Reporting			XXXX									
PWS Salmon												
AWL Sampling												
Catch												
Sockeye						XXXXXXXXXXXXXXXXXXXX						
Chum						XXXXXXXXXXXXXXXXXXXX						
Escapement												
Sockeye						XXXXXXXXXXXXXXXXXXXX						
Pink Sex Ratio Sampling						XXXXXXXXXXXXXXXXXXXX						
CWT Sampling (pinks)						XXXXXXXXXXXX						
AWL Data Analysis						XXXXXXXXXXXXXXXXXXXX						
AWL Data Reporting	XXXXXXXXXXXX											
Sex Ratio Data Analysis						XXXXXXXXXXXXXXXXXXXX						
Sex Ratio Data Reporting			XXXX									
Personnel												
FB II Project Leader		XX										
FB I Assistant Project Leader			XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX									
FT I Sampler			XXXXXXXXXXXXXXXXXXXX	-----1/-----	XXXXXXXXXXXX							
FT I Sampler				XXXXXXXXXXXXXXXXXXXX								
FT I Sampler				XXXXXXXXXXXXXXXXXXXX								
CI IV Intern				XXXXXXXXXXXXXXXXXXXX								
CI IV Intern				XXXXXXXXXXXXXXXXXXXX								

1/ Funded and operated by Sport Fish.

SELECTED MAPS AND PLOTTING INSTRUCTIONS FOR  
ALASKA FISHERIES MICRO-COMPUTER MAPPING SYSTEM

Feb 16, 1988 version

Page	
1	A) Map and index files
2	1) Names of Alaska map and index files
3	2) Listing of Cook Inlet index file
	3) Listing of map data for two islands
4-5	B) Plotting instructions
	C) Plotting instructions for maps of:
6-8	1) Southern part of Cook Inlet
9	a) Kamishak, Southern, Outer and Eastern districts.
10	b) Kamishak district.
	c) Southern, Outer and Eastern districts.
11-14	2) Prince Wm Sound northern half comparing Pink salmon mean odd year escapement (1979-87) with 1987 escapement. Radius of circle at stream mouth is based on ratio of escapements. Thin circles for 1987 escapement above mean escapement. Thick circles for 1987 escapement below mean escapement.
15-16	3) Cook Inlet Central district with 1986 commercial Sockeye catch.
17-18	4) Homer-Seldovia area with axis labels and location code table.
19	5) Other areas
20	a) Kodiak Island
21	b) Alaska Peninsula
22	c) Bristol Bay
23	d) Kuskokwim Delta
24	e) Seward Peninsula
	f) Southeast
25-27	6) State of Alaska

## aska map files and index files

map files	size	description	coast
ALEUT-E.BIN	81740	Aleutian Islands	East of 180 degrees W longitude
ALEUT-W.BIN	20238	Aleutian Islands	West of 180 degrees W longitude
BBAY.BIN	92330	Bristol Bay	False Pass to Kinak Bay (E of Nunivak I)
COOK.BIN	33679	Cook Inlet	Trading Bay to Cape Aklek (W of Kodiak I)
KODIAK.BIN	90376	Kodiak/Peninsula	Cape Aklek to False Pass
KUSK.BIN	99033	Kuskokwim	Kinak Bay to Pt Romanof (Norton Sound)
NS-CR.BIN	47620	North Slope coast & rivers	Wainwright to Canadian border
NS-I1.BIN	3879	North Slope islands 1 of 2	
NS-I2.BIN	4679	North Slope islands 2 of 2	
NS-L1.BIN	13170	North Slope lakes 1 of 2	
NS-L2.BIN	15502	North Slope lakes 2 of 2	
NW-C.BIN	61937	Northwest coast	Pt Romanof to Wainwright
NW-RIL.BIN	45752	Northwest rivers-islands-lakes	
PWS.BIN	84308	Prince Wm Sound	Yakutat to Trading Bay
SE-C.BIN	93994	Southeast coast	Hyder to Yakutat
SE-RBIL.BIN	90282	Southeast rivers-political boundaries-islands-lakes	
YUKON-E.BIN	59877	Yukon above Tanana	
YUKON-W1.BIN	52910	Yukon below Tanana 1 of 2	
YUKON-W2.BIN	35454	Yukon below Tanana 2 of 2	

1.03 M bytes

COOK2.BIN=COOK.BIN plus PWS coastline from Port Wells to Trading Bay

index files	TOTAL		COAST		RIVERS		POLITICAL BOUNDARIES		ISLANDS		LAKES	
	#rec	#points	#rec	#points	#rec	#points	#rec	#points	#rec	#points	#rec	#points
ALEUT.IDX	78	12,133	15	8,021	0	0	0	0	60	4,032	3	80
BBAY.IDX	70	10,990	2	4,731	9	1,154	0	0	12	377	47	4,728
COOK.IDX	31	3,968	1	1,791	4	778	0	0	15	536	11	863
KODIAK.BIN	72	10,730	5	7,241	0	0	0	0	66	3,431	1	58
KUSK.BIN	135	11,316	3	3,875	6	2,539	0	0	20	865	106	4,037
NS.IDX	166	9,299	2	2,742	18	3,053	0	0	34	802	112	2,702
NW.IDX	103	12,650	7	7,687	16	2,765	0	0	17	582	63	1,616
PWS.IDX	44	10,192	2	6,365	3	993	0	0	35	2,513	4	321
SE.IDX	148	21,869	6	11,702	2	91	3	1,357	130	8,454	7	265
YUKON-E.IDX	51	7,083	0	0	23	5,920	1	282	0	0	27	881
YUKON-W.IDX	100	10,258	0	0	28	8,459	0	0	29	729	43	1,070
ALASKA.IDX	998	120,488	43	54,155	107	25,752	4	1,639	418	22,321	424	16,621

e data points were digitized at the Geophysical Institute in Fairbanks.

ev were transferred from the University of Alaska VAX computer on a phone line to the Compaq.

## Computer data for two islands

15 5 12 3 3 0 59.39361 59.37500 -153.57777 -153.53944 C\_Island W of Augustine I

1 59.38556 -153.53944  
 2 59.38139 -153.54445  
 3 59.37833 -153.55222  
 4 59.37667 -153.56277  
 5 59.37500 -153.57361  
 6 59.37833 -153.57777  
 7 59.38334 -153.57445  
 8 59.38694 -153.56805  
 9 59.39056 -153.56166  
 10 59.39278 -153.55251  
 11 59.39361 -153.54056  
 12 59.38556 -153.53944

13 5 21 3 3 0 59.39000 59.36250 -150.43611 -150.36333 C\_Rabbit I

1 59.38167 -150.36333  
 2 59.37611 -150.36610  
 3 59.37083 -150.36861  
 4 59.36528 -150.37138  
 5 59.36250 -150.37944  
 6 59.36472 -150.38889  
 7 59.36806 -150.39555  
 8 59.37056 -150.40361  
 9 59.37333 -150.41167  
 10 59.37472 -150.42250  
 11 59.37472 -150.43611  
 12 59.37750 -150.43195  
 13 59.37806 -150.42000  
 14 59.37750 -150.40778  
 15 59.37889 -150.39694  
 16 59.38222 -150.39027  
 17 59.38583 -150.38361  
 18 59.38778 -150.37416  
 19 59.39000 -150.36501  
 20 59.38361 -150.36362  
 21 59.38167 -150.36333

Plotting instructions (continued)

---

Record	Variable	Description
10	1	Number of circles to plot for cities
	2	Radius of circle in units based on longitude range (If 0, default=100) If < 0, the next record contains: Latitude, Longitude, starting line, step between lines, width(cm), height(cm) followed by text lines to be plotted.
11		CITY 1 Name (25 character maximum)
12	1	Latitude
	2	Longitude
	3	Position (1=right, 2=centered, 3=left)
	4	#spaces to right (use negative to move left)
	5	#lines above (use negative to lower)
	6	Angle (degrees) zero is horizontal
	7	Width(cm) (If 0, default value used)
	8	Height(cm) (If 0, default value used)
13		CITY 2 Name
14		Lat, long, posit, right, above, angle, width, ht
...		...
		LABEL 1 Name
		Lat, long, posit, right, above, angle, width, ht
		LABEL 2 Name
		Lat, long, posit, right, above, angle, width, ht
...		...



# Plotting instructions for map of Kamishak, Southern, Outer and Eastern districts

Before running the MAP program type MODE COM1:4800,N,8,1,P

The following file = COOK4 contains plotting instructions:

Kamishak, Southern, Outer and Eastern Districts

```

0 0 0 0      Title char width(cm) & ht(cm) (0=default), plot title(0=yes), plot border(0=yes)
3           Paper (1= 8½x11, Lower-Left origin; 2= 8½x11, Upper-L; 3= 11x17, U-L; 4= 11x17, U-R)
0           Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]
\MAPDATA\COOK2.BIN  Map filename (If blank, no map drawn)
58.65 60.2     RECTANGLE Minimum & maximum latitude
148.7 154.5    RECTANGLE Minimum & maximum longitude
0 0 0 0      AXIS-LABEL start latitude, step, #tics, #digits after decimal point
0 0 0 0      AXIS-LABEL start longitude, step, #tics, #digits after decimal point
3 0          Number of CITIES (circle drawn for each city) & circle radius (If 0, use default)

Homer
59.64 151.49 2 0 .9 0 .2 .3
Seldovia
59.44 151.71 1 -1 -.9 0 .2 .3
Seward
60.11 149.44 2 0 .9 0 .2 .3

```

# Plotting instructions for map of Kamiahak, Southern, Outer and Eastern districts (continued)

C\_East Chugach I  
 C\_Parl I  
 C\_Elizabeth I  
 C\_Ragged I  
 C\_Rabbit I  
 C\_Nuka I  
 C\_Island W of Augustine I  
 C\_Chiaik I  
 C\_Tustumena Lake  
 S\_Port Wella to Trading Bay  
 C\_Trading Bay to Cape Aklek

Lat.	Long.	posit	space right	space above	angle (deg)	width (cm)	ht. (cm)	name
59.640	151.490	Center	.0	.9	0.	.200	.300	Homer
59.440	151.710	Right	-1.0	-.9	0.	.200	.300	Seldovia
60.110	149.440	Center	.0	.9	0.	.200	.300	Seward

Plot 3 circles for cities

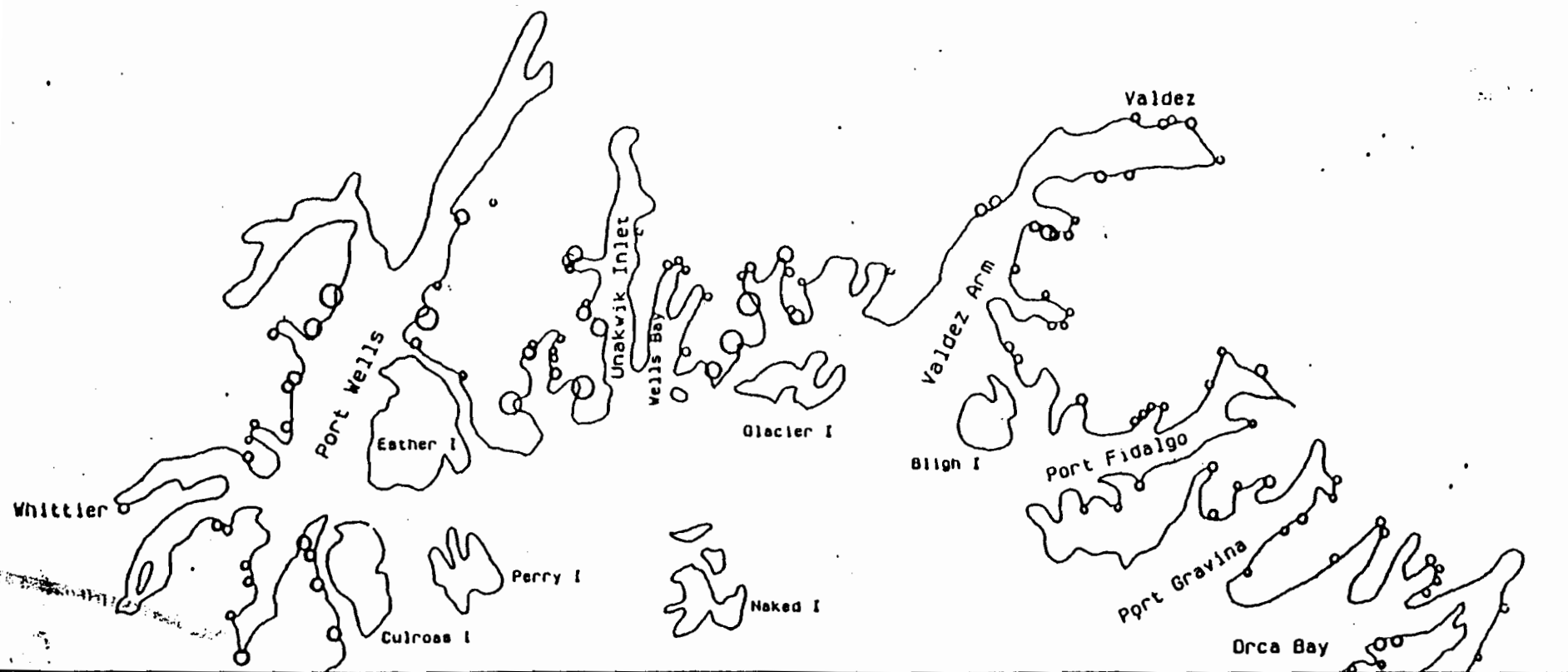
# Plotting instructions for map of Kamishak district

## Kamishak District

```

0 0 0 0      Title char width(cm) & ht(cm) (0=default), plot title(0=yes), plot border(0=
2           Paper (1= 8½x11, Lower-Left origin; 2= 8½x11, Upper-L; 3= 11x17, U-L; 4= 11x
0           Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]
\MAPDATA\COOKE2.BIN  Map filename (If blank, no map drawn)
58.80 59.86    RECTANGLE Minimum & maximum latitude
152.79 154.35  RECTANGLE Minimum & maximum longitude
0 0 0 0      AXIS-LABEL start latitude, step, #tics, #digits after decimal point
0 0 0 0      AXIS-LABEL start longitude, step, #tics, #digits after decimal point
0 0          Number of CITIES (circle drawn for each city) & circle radius (If 0, use def:
Chinitna Bay
59.85 153.20 1 0 0 0 .14 .21
Iniskin Bay
59.72 153.40 3 2 0 65 .14 .21
Iliamna Bay
59.633 153.60 1 0 0 -35 .14 .21
South Head
59.61 153.60 3 0 0 0 .14 .21
Ursus Cove
59.535 153.74 1 0 0 -30 .14 .21
Augustine I
59.28 153.45 2 0 0 0 .2 .3
Bruin Bay
59.37 154.06 1 0 0 8 .14 .21
Contact Point
59.34 154.06 3 0 0 25 .14 .21
McNeil Cove
59.15 154.20 1 0 0 15 .14 .21
Akumwarvik Bay
59.07 154.16 1 0 0 20 .14 .21
Cape
58.87 153.20 1 0 0 0 .2 .3
Douglas
58.87 153.20 1 0 -1 0 .2 .3

```



PWS Northern half. comparison of 1987 Pink escapement with mean of 79, 81, 83 & 85 .

# Plotting instructions for map of northern half of Prince Wm Sound

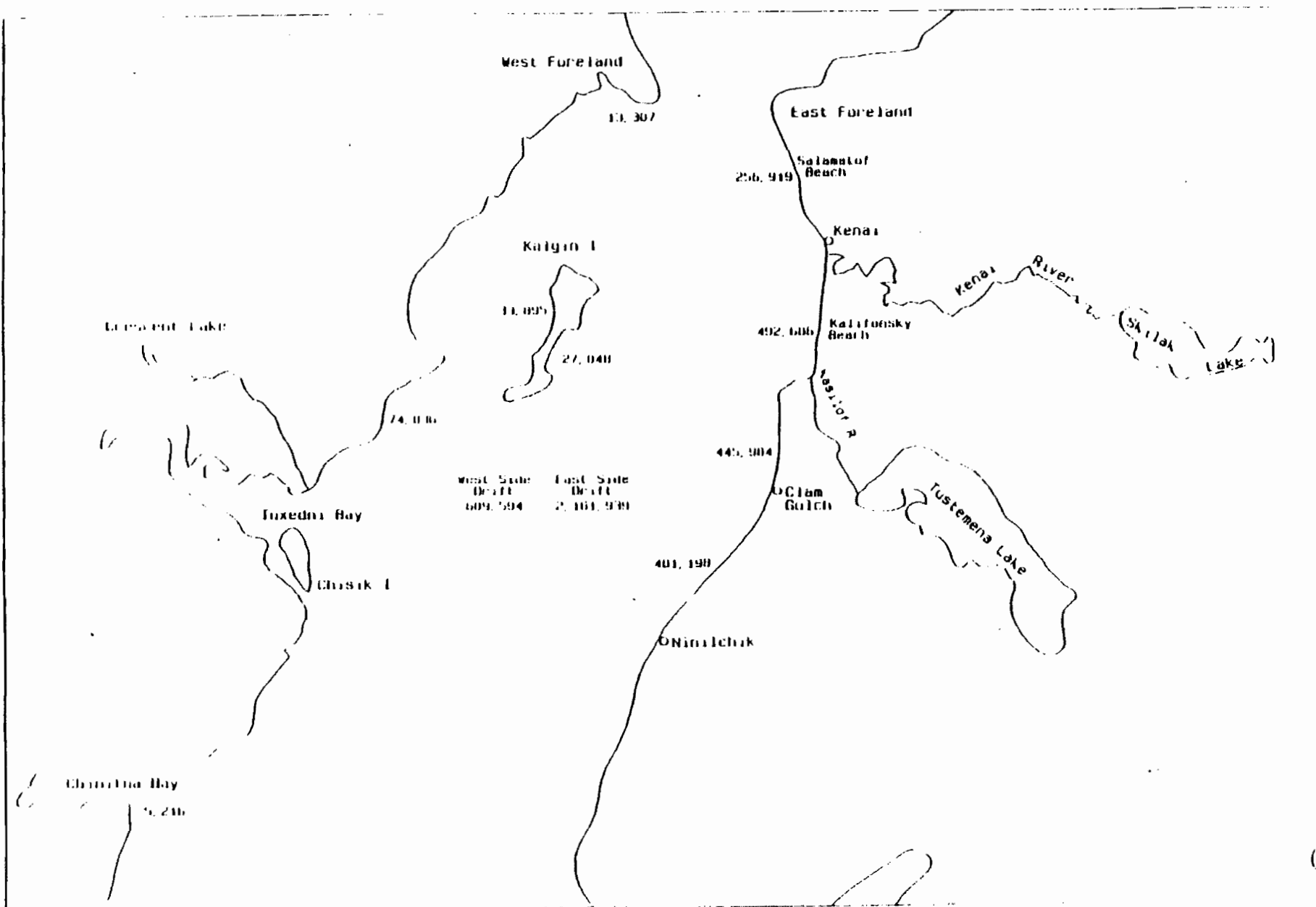
Compare Pink salmon mean ~~year~~<sup>old</sup> year escapement (1979-85) with 1987 escapement.  
 Radius of circle at stream mouth is based on ratio of escapements.  
 Color of circle shows whether 1987 escapement is above average (green)  
 or below average (red). Green circles are thin. Red circles are thick.

## Location of anadromous streams

Lat	Long	Subd	Num	Name	Mean Escapement	1987 Escapement
60.503	145.841	221-10	20	Hartney Creek	0	0
60.533	145.775	221-10	50	Eccles Creek	0	0
60.564	145.726	221-10	80	Fleming Creek	0	0
60.614	145.666	221-10	110	Humpy Creek	13877	20410
60.635	145.830	221-20	190	Twin Lakes Creek	2055	2390
60.646	145.803	221-20	200	Spring Creek	4367	3650
60.659	145.798	221-20	210	Rogue Creek	7945	8860
60.669	145.816	221-20	230	Chase Creek	7997	14260
60.699	145.912	221-20	350	Koppen Creek	73770	40340
60.710	145.918	221-20	360	Sheep River	18952	11470
60.676	146.025	221-20	370	Allen Creek	2195	3190
60.667	146.216	221-30	410	Pasa Creek	1590	1310
60.707	146.128	221-30	450	Plateau Creek	6782	5240
60.718	146.088	221-30	460	Comfort Creek	13662	7030
60.738	146.020	221-30	480	Beartrap River	30755	33500
60.756	146.009	221-30	490	Cataract Creek	780	1090
60.758	146.155	221-30	510	Olsen Creek	60695	22780
60.756	146.226	221-30	520	Control Creek	35917	30150
60.728	146.283	221-30	540	Carlsen Creek	7157	4110
60.777	146.277	221-30	560	St. Matthews Creek	12467	6860
60.741	146.566	221-40	710	Two Moon Creek	0	0
60.741	146.492	221-40	730	Tundra Creek	0	0
60.762	146.442	221-40	760	Irish Creek	37562	22400
60.819	146.184	221-40	800	Whalen Creek	26827	26330
60.872	146.160	221-40	830	Keta Creek	13170	4930
60.894	146.245	221-40	870	Sunny River	8867	7060
60.862	146.278	221-40	880	Short Creek	2560	3570
60.842	146.379	221-40	890	Fish Creek	34905	28380
60.843	146.408	221-40	920	Shale Creek	3335	3040
60.836	146.426	221-40	930	Kirkwood Creek	3927	3360
60.829	146.445	221-40	940	Rock Creek	1587	1140
60.854	146.558	221-40	990	Lagoon Creek	11292	5410
60.899	146.696	221-50	1060	Gladhough Creek	1777	2590
60.912	146.715	221-50	1070	Black Creek	272	510
60.931	146.618	221-50	1140	Turner Creek	863	1220

Plotting instructions for map of northern half of Prince Wm Sound (continued)

Lat	Long	Subd	Num	Name	Mean Escapement	1987 Escapement
60.921	147.717	222-30	2770	Dead Creek	177	180
60.928	147.717	222-30	2780	Comeback Creek	810	740
60.940	147.699	222-30	2790	Canyon Creek	5095	4220
60.935	147.762	222-30	2820	Good Creek	1525	1040
60.927	147.770	222-30	2830	Bad Creek	2920	960
60.877	147.817	222-30	2890	Derickaon Creek	0	2530
61.047	147.516	222-50	2420	Cowpen Creek	0	0
60.992	148.210	223-10	4140	Harrison Creek	460	0
60.960	148.253	223-10	4170	Hobo Creek	4402	740
60.955	148.340	223-10	4210	Mill Creek	5715	3040
60.909	148.295	223-10	4240	Old Creek	522	150
60.901	148.308	223-10	4250	Hummer Creek	1190	420
60.859	148.313	223-10	4280	Pirate Creek	525	240
60.863	148.384	223-10	4300	Meacham Creek	8992	6700
60.847	148.401	223-10	4320	Swanson Creek	21912	22800
60.907	147.920	223-20	3030	Triple Creek	1670	1580
60.941	148.024	223-20	3070	Village Creek	900	440
60.966	147.998	223-30	3100	Golden Lagoon	10	0
60.999	147.972	223-30	3140	Avery River	55	50
61.069	147.912	223-30	3220	Coghill River - Below Weir	130775	31500
61.083	147.840	223-30	3221	Coghill River - Lake Count	0	0
60.829	148.400	224-10	4350	Logging Camp Creek	3460	1820
60.760	148.474	224-10	4500	Tebenkoff Creek	1325	700
60.755	148.453	224-10	4510	Blackatone Creek	535	860
60.718	148.414	224-10	4540	Halferty Creek	4375	2950
60.701	148.408	224-10	4550	Paulson Creek	6467	4470
60.666	148.448	224-10	4580	Parka Creek	2070	1440
60.621	148.425	224-10	4610	Cochrane Creek	3573	820
60.739	148.283	224-10	4690	Wickett Creek	2530	670
60.726	148.270	224-30	4710	Narrowa Creek	640	280
60.696	148.256	224-30	4760	Shrode Creek	80235	25460
60.644	148.220	224-30	4790	Culrossa Creek	6732	1850
60.597	148.262	224-40	4800	Mink Creek	12465	12390
60.565	148.352	224-40	4840	E. Finger Creek	1850	4180
60.588	148.426	224-40	4850	W. Finger Creek	5432	4060
60.518	148.218	224-40	4930	Moat Creek	587	560
60.491	148.190	224-40	4950	Chimeviaky Lagoon	7260	600
60.499	148.155	224-40	4980	McClure Creek	4277	2280



Central district with 1906 commercial Sockeye catch

# Plotting instructions for map of Central district with 1986 commercial catch

Central district with 1986 commercial Sockeye catch

```

0 0 0 0      Title char width(cm) & ht(cm) (0=default), plot title(0=yes), plot border(0=yes)
3            Paper (1= 8½x11, Lower-Left origin; 2= 8½x11, Upper-L; 3= 11x17, U-L; 4= 11x17, L-L)
0            Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]
\MAPDATA\COOK2.BIN  Map filename (If blank, no map drawn)
59.73 60.80      RECTANGLE Minimum & maximum latitude
150.0 153.3      RECTANGLE Minimum & maximum longitude
0 0 0 0      AXIS-LABEL start latitude, step, #tics, #digits after decimal point
0 0 0 0      AXIS-LABEL start longitude, step, #tics, #digits after decimal point
3 0           Number of CITIES (circle drawn for each city) & circle radius (If 0, use default)

Kenai
60.55 151.27 1 .7 .5 0 .16 .24
Ninilchik
60.05 151.67 1 1 0 0 .16 .24
Clam
60.24 151.39 1 1 0 0 .16 .24
Gulch
60.24 151.39 1 1 -.8 0 .16 .24
Kasilof R
60.39 151.28 1 0 0 -65 .14 .21
Tustumena Lake
60.25 151.00 1 0 0 -43 .16 .24
Kalifornsky
60.45 151.26 1 0 0 0 .14 .21
Beach
60.45 151.26 1 -.2 -.8 0 .14 .21
Kenai
60.49 150.94 1 0 0 35 .16 .24
River
60.53 150.74 1 0 0 -30 .16 .24
Skilak
60.455 150.50 1 0 0 -30 .16 .24
Lake
60.398 150.30 1 0 0 10 .16 .24
Salamatof
60.65 151.35 1 0 0 0 .14 .21
Beach
60.65 151.35 1 1 -.8 0 .14 .21

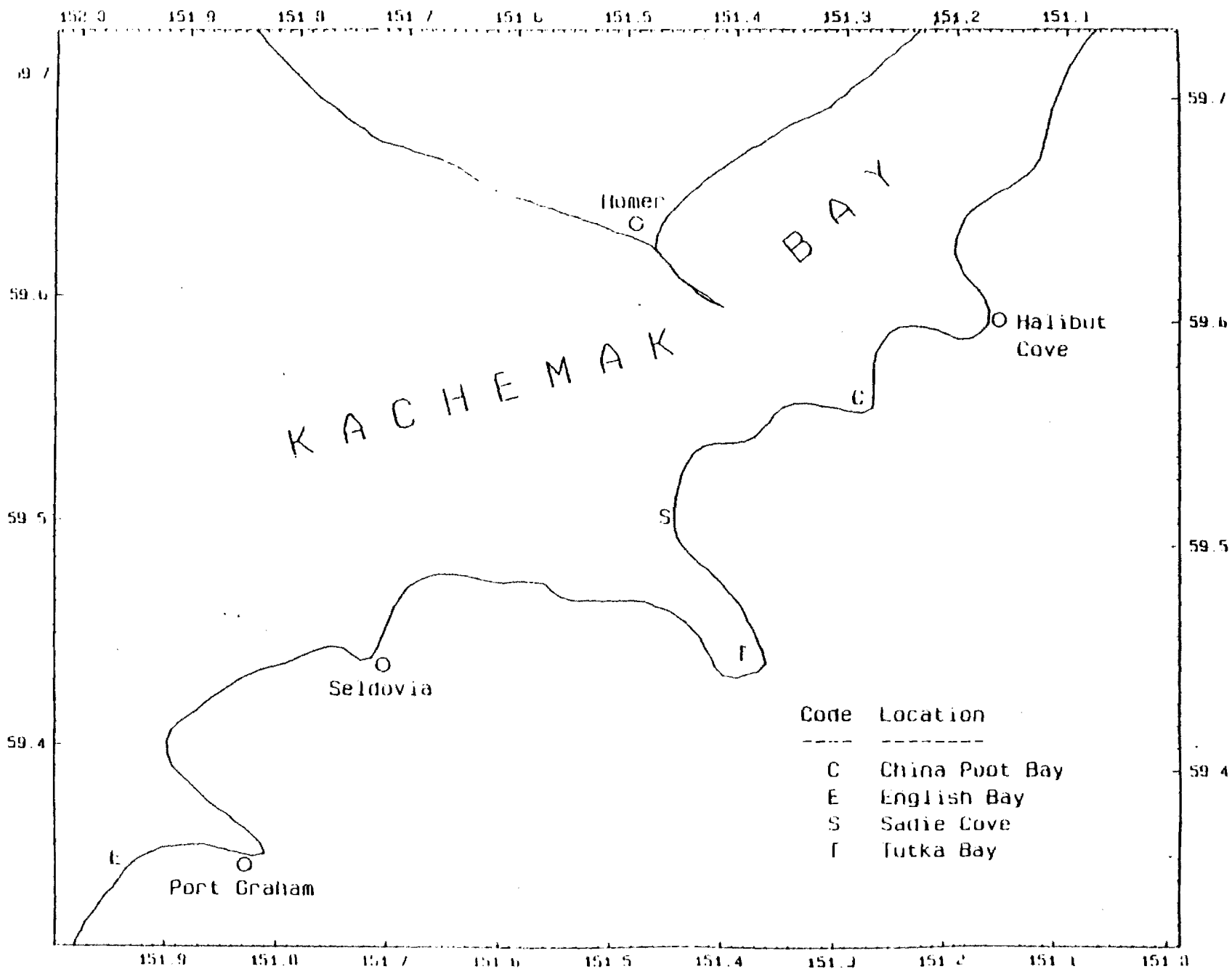
```

```

East Foreland
60.71 151.39 1 1 0 0 .16 .24
West Foreland
60.77 151.80 3 0 0 0 .16 .24
Kalgin I
60.54 151.95 2 0 0 0 .16 .24
Crescent Lake
60.40 152.95 2 0 1 0 .16 .24
Tuxedni Bay
60.195 152.72 1 1 0 0 .16 .24
Chisik I
60.11 152.57 1 1 0 0 .16 .24
Chinitna Bay
59.85 153.18 1 1 0 0 .16 .24

```





Homer-Seldovia area with location code table and axis labels

Plotting instructions for map of Homer-Seldovia area showing map accuracy

Homer-Seldovia area with location code table and axis labels

0 0 0 1	Title char width(cm) & ht(cm) (0=default), plot title(0=yes), plot.border(0:
1	Paper (1= 8½x11, Lower-Left origin; 2= 8½x11, Upper-L; 3= 11x17, U-L; 4= 11)
0	Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]
\MAPDATA\COOK2.BIN	Map filename (If blank, no map drawn)
59.32 59.72	RECTANGLE Minimum & maximum latitude
151.0 152.0	RECTANGLE Minimum & maximum longitude
0 0 0 0	AXIS-LABEL start latitude, step, #tics, #digits after decimal point
0 0 0 0	AXIS-LABEL start longitude, step, #tics, #digits after decimal point
4 200	Number of CITIES (circle drawn for each city) & circle radius (If 0, use de

Port Graham

59.348 151.83 2 0 -0.9 0 .16 .24

Seldovia

59.44 151.71 2 0 -0.9 0 .16 .24

Homer

59.64 151.49 2 0 .9 0 .16 .24

Halibut

59.60 151.16 1 1.5 0 0 .16 .24

Cove

59.60 151.16 1 1.5 -1 0 .16 .24

K A C H E M A K

59.59 151.45 3 0 0 15 .32 .48

B A Y

59.63 151.35 1 0 0 40 .32 .48

C

59.565 151.29 1 0 0 0 .16 .24

S

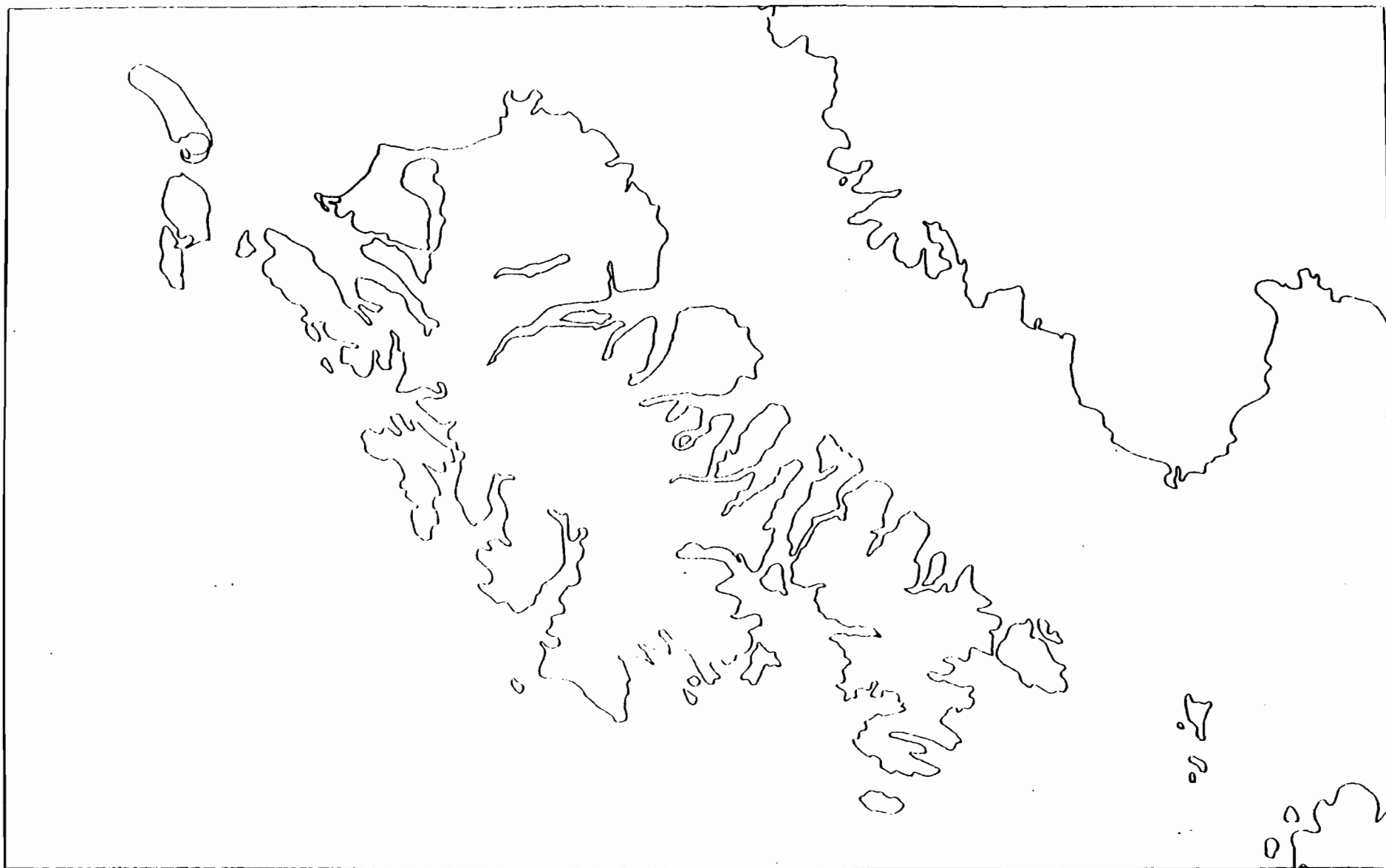
59.51 151.462 1 0 0 0 .16 .24

T

59.45 151.39 1 0 0 0 .16 .24

E

59.35 151.95 1 0 0 0 .16 .24



# Plott1 - instructions for map of Kodiak Island

## K O D I A K I S L A N D

0 0 0 0

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=

4

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x

0

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

\MAPDATA\KODIAK.BIN

Map filename (If blank, no map drawn)

56.2 59.3

RECTANGLE Minimum &amp; maximum latitude

151.6 155.0

RECTANGLE Minimum &amp; maximum longitude

## K O D I A K I S L A N D

0 0 1 1

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=

4

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x

0

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

\MAPDATA\COOK.BIN

Map filename (If blank, no map drawn)

56.2 59.3

RECTANGLE Minimum &amp; maximum latitude

151.6 155.0

RECTANGLE Minimum &amp; maximum longitude

# Plotting instructions for map of Alaska Peninsula

## ALASKA PENINSULA

0 0 0 0

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=yes)

3

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x17)

0

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

\MAPDATA\KODIAK.BIN

Map filename (If blank, no map drawn)

54.5 57.0

RECTANGLE Minimum &amp; maximum latitude

156.0 163.5

RECTANGLE Minimum &amp; maximum longitude

## ALASKA PENINSULA

0 0 1 1

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=yes)

3

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x17)

0

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

\MAPDATA\BBAY.BIN

Map filename (If blank, no map drawn)

54.5 57.0

RECTANGLE Minimum &amp; maximum latitude

156.0 163.5

RECTANGLE Minimum &amp; maximum longitude

# Plotting instructions for map of Bristol Bay

## BRISTOL BAY

0 0 0 0

3

0

\MAPDATA\BBAY.BIN

56.8 59.5

154.0 162.5

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

Map filename (If blank, no map drawn)

RECTANGLE Minimum &amp; maximum latitude

RECTANGLE Minimum &amp; maximum longitude

## BRISTOL BAY

0 0 1 1

3

0

\MAPDATA\KODIAK.BIN

56.8 59.5

154.0 162.5

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

Map filename (If blank, no map drawn)

RECTANGLE Minimum &amp; maximum latitude

RECTANGLE Minimum &amp; maximum longitude

## BRISTOL BAY

0 0 1 1

3

0

\MAPDATA\COOK.BIN

56.8 59.5

154.0 162.5

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

Map filename (If blank, no map drawn)

RECTANGLE Minimum &amp; maximum latitude

RECTANGLE Minimum &amp; maximum longitude

# Plotting instructions for map of Kuakokwim Delta

## K U S K O K W I M   D E L T A

0 0 0 0

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=y

3

Paper (1= 8½x11, Lower-Left origin; 2= 8½x11, Upper-L; 3= 11x17, U-L; 4= 11x1

0

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

\MAPDATA\KUSK.BIN

Map filename (If blank, no map drawn)

60.0 61.5

RECTANGLE Minimum &amp; maximum latitude

160.0 168.0

RECTANGLE Minimum &amp; maximum longitude

## K U S K O K W I M   D E L T A

0 0 1 1

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=y

3

Paper (1= 8½x11, Lower-Left origin; 2= 8½x11, Upper-L; 3= 11x17, U-L; 4= 11x1

0

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

\MAPDATA\BBAY.BIN

Map filename (If blank, no map drawn)

60.0 61.5

RECTANGLE Minimum &amp; maximum latitude

160.0 168.0

RECTANGLE Minimum &amp; maximum longitude

Plotting instructions for map of Seward Peninsula

23 2:

SEWARD. PENINSULA

0 0 0 0 Title char width(cm) & ht(cm) (0=default), plot title(0=yes), plot border(0  
4 Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11  
0 Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]  
\MAPDATA\NW-C.BIN Map filename (If blank, no map drawn)  
64.0 68.5 RECTANGLE Minimum & maximum latitude  
160.0 168.5 RECTANGLE Minimum & maximum longitude

SEWARD PENINSULA

0 0 1 1 Title char width(cm) & ht(cm) (0=default), plot title(0=yes), plot border(0  
4 Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11  
0 Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]  
\MAPDATA\NW-RIL.BIN Map filename (If blank, no map drawn)  
64.0 68.5 RECTANGLE Minimum & maximum latitude  
160.0 168.5 RECTANGLE Minimum & maximum longitude



# Plotting instructions for map of Southeast

## S O U T H E A S T

0 0 0 0

3

0

\MAPDATA\SE-C.BIN

55.0 60.0

129.8 140.0

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=yes)

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x17

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

Map filename (If blank, no map drawn)

RECTANGLE Minimum &amp; maximum latitude

RECTANGLE Minimum &amp; maximum longitude

## S O U T H E A S T

0 0 1 1

3

0

\MAPDATA\SE-RBIL.BIN

55.0 60.0

129.8 140.0

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=yes)

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x17

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

Map filename (If blank, no map drawn)

RECTANGLE Minimum &amp; maximum latitude

RECTANGLE Minimum &amp; maximum longitude

## S O U T H E A S T

0 0 1 1

3

0

\MAPDATA\PWS.BIN

55.0 60.0

129.8 140.0

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border(0=yes)

Paper (1= 8x11, Lower-Left origin; 2= 8x11, Upper-L; 3= 11x17, U-L; 4= 11x17

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

Map filename (If blank, no map drawn)

RECTANGLE Minimum &amp; maximum latitude

RECTANGLE Minimum &amp; maximum longitude

# Plotting instructions for State of Alaska map

---

/\* REXX file to draw map of Alaska

To produce map, type: RXINTMGR

STACKMGR

REXX A

1 hour and 28 minutes to draw map with Compaq 386 & Fujitsu ImageGraph plotter \*/

queue 'MAP'

queue 'A01'

queue 'N'

queue 'N'

queue 'MAP'

queue 'A02'

queue 'N'

queue 'N'

queue 'MAP'

queue 'A03'

queue 'N'

queue 'N'

queue 'MAP'

queue 'A04'

queue 'N'

queue 'N'

queue 'MAP'

queue 'A05'

queue 'N'

queue 'N'

queue 'MAP'

queue 'A06'

queue 'N'

queue 'N'

queue 'MAP'

queue 'A07'

queue 'N'

queue 'N'

queue 'MAP'

queue 'A08'

queue 'N'

queue 'N'

queue 'MAP'

queue 'A09'

queue 'N'

queue 'N'

## Plotting instructions for State of Alaska map (continued)

( file A01 )

A L A S K A

0 0 0 0

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border

3

Paper (1= 8½x11, Lower-Left origin; 2= 8½x11, Upper-L; 3= 11x17, U-L; 4= 1

0

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

Map filename (If blank, no map drawn)

51.99 71

RECTANGLE Minimum &amp; maximum latitude

129 172

RECTANGLE Minimum &amp; maximum longitude

( file A02 )

A L A S K A

0 0 1 1

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border

3

Paper (1= 8½x11, Lower-Left origin; 2= 8½x11, Upper-L; 3= 11x17, U-L; 4= 1

0

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

\MAPDATA\SE-C.BIN

Map filename (If blank, no map drawn)

51.99 71

RECTANGLE Minimum &amp; maximum latitude

129 172

RECTANGLE Minimum &amp; maximum longitude

( file A03 )

A L A S K A

0 0 1 1

Title char width(cm) &amp; ht(cm) (0=default), plot title(0=yes), plot border

3

Paper (1= 8½x11, Lower-Left origin; 2= 8½x11, Upper-L; 3= 11x17, U-L; 4= 1

0

Maximum drawing speed (cm/sec) [If 0, use 25 cm/sec]

\MAPDATA\SE-RBIL.BIN

Map filename (If blank, no map drawn)

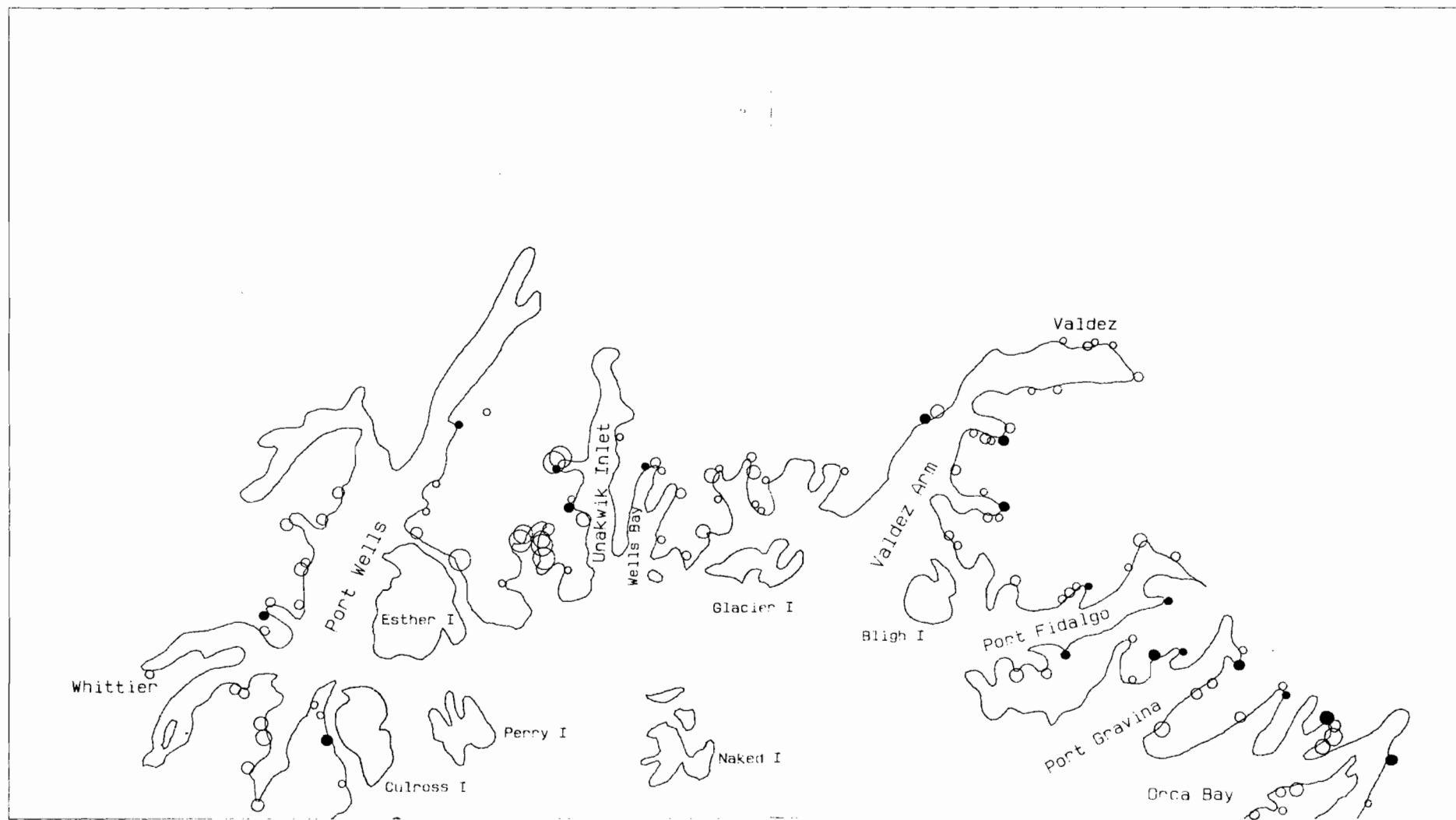
51.99 71

RECTANGLE Minimum &amp; maximum latitude

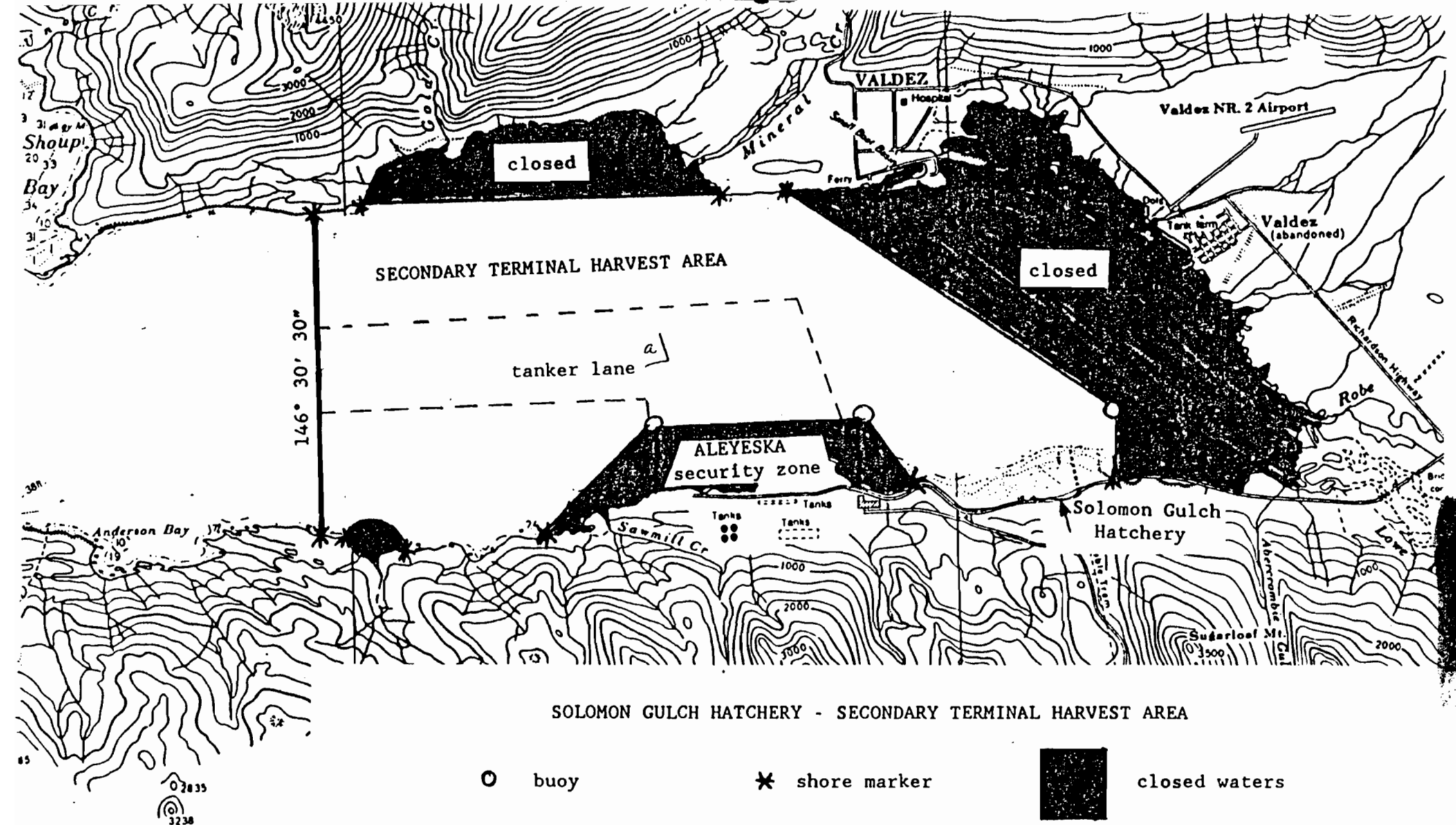
129 172

RECTANGLE Minimum &amp; maximum longitude

Similar files for A04, a05, ..., A19



PWS Northern half, compare 1985 Pink escapement with mean of 75, 77, 79, 81, 83 & 87



This area has been established to facilitate the commercial harvest of surplus salmon returning to the Solomon Gulch Hatchery. It will be open and closed only by field announcement made by the Alaska Department of Fish and Game. Openings and closures are normally announced on VHF channel 7. Areas in front of anadromous streams, as designated on this map, will be closed to commercial fishing. In addition the Aleyeska tanker security zone will be closed to commercial fishing. The Valdez Coast Guard will not allow fishing in the tanker lane when there is tanker traffic inside the Port.

as Requested by the Coast Guard. This area must be cleared whenever a tanker comes into the port. Fishermen generally get a 7 hr advance notice - Halara

## Appendix I. Tagging Data From the Cannery Creek Hatchery

DATE	HRS	g/FRY	NET TAGGED	REJECTS	Tag Retention		RET TAGS	% RET	VALID TAGS	VALID TAGS /HR	MORTS	% VALID CLIPS	SHIFT VALID MARKS	TOTAL VALID MARKS	CUM VALID MARKS	TRIP NUMBER	CUMULATIVE TAGS IN TRIP
					TOTAL TAGGED	FRY SAMP											
11-Apr	3.0	0.22	1,066	0	1,066	100	92	92%	981	327	11	85%	823	0	823		TAG CODE 3B-
11-Apr	6.0	0.22	1,652	0	1,652	100	87	87%	1,437	240	28	75%	1,050	1,873	1,873		
12-Apr	4.5	0.22	2,373	0	2,373	105	95	90%	2,147	477	11	85%	1,814	0	3,686		
12-Apr	6.0	0.22	2,201	157	2,044	100	95	95%	1,942	324	41	85%	1,610	3,423	5,296		
14-Apr	6.0	0.22	3,019	58	2,961	100	96	96%	2,843	474	44	95%	2,656	0	7,952		
14-Apr	6.0	0.22	3,584	54	3,530	100	97	97%	3,424	571	42	85%	2,868	5,525	10,821		
15-Apr	6.0	0.22	3,408	73	3,335	100	94	94%	3,135	522	21	80%	2,487	0	13,308		
15-Apr	6.0	0.22	4,785	95	4,690	100	97	97%	4,549	758	39	90%	4,055	6,542	17,363	4	17,363
16-Apr	6.0	0.22	2,723	104	2,619	100	87	87%	2,279	380	47	100%	1,935	0	19,299		
16-Apr	6.0	0.22	5,083	118	4,965	100	98	98%	4,866	811	12	95%	4,610	6,546	23,909		
17-Apr	6.0	0.22	3,105	31	3,074	100	81	81%	2,490	415	22	70%	1,721	0	25,630		
17-Apr	6.0	0.22	4,845	132	4,713	200	186	93%	4,383	731	22	100%	4,361	6,082	29,991		
18-Apr	5.5	0.22	4,561	81	4,480	100	97	97%	4,346	790	26	80%	3,450	0	33,441		
18-Apr	6.0	0.22	3,328	83	3,245	200	165	83%	2,677	446	33	90%	2,376	5,827	35,818		
19-Apr	6.0	0.22	2,846	35	2,811	200	177	89%	2,488	415	43	90%	2,196	0	38,014		
19-Apr	6.0	0.22	4,556	71	4,485	200	182	91%	4,081	680	7	100%	4,074	6,270	42,088		
20-Apr	6.0	0.22	2,841	17	2,824	100	96	96%	2,711	452	7	91%	2,460	0	44,548		
20-Apr	5.5	0.22	4,224	17	4,207	100	97	97%	4,081	742	115	98%	3,864	6,324	48,412	5	31,049
21-Apr	5.0	0.22	2,219	20	2,199	100	93	93%	2,045	409	32	100%	2,013	0	50,425		
21-Apr	4.0	0.22	2,747	44	2,703	100	87	87%	2,352	588	51	100%	2,301	4,314	52,726		
22-Apr	6.0	0.22	3,454	46	3,408	200	188	94%	3,204	534	15	95%	3,028	0	55,754		
22-Apr	6.0	0.22	5,108	89	5,019	300	289	96%	4,835	806	36	100%	4,799	7,827	60,553		
23-Apr	6.0	0.22	4,653	55	4,598	100	98	98%	4,506	751	11	100%	4,495	0	65,048		
23-Apr	6.0	0.22	3,664	41	3,623	200	191	96%	3,460	577	19	100%	3,441	7,936	68,489		
24-Apr	6.0	0.22	3,607	26	3,581	200	192	96%	3,438	573	24	95%	3,242	0	71,731		
24-Apr	6.0	0.22	5,170	43	5,127	200	196	98%	5,024	837	21	100%	5,003	8,245	76,734	6	28,322
25-Apr	6.0	0.22	3,536	45	3,491	200	195	98%	3,404	567	12	95%	3,222	0	79,956		
25-Apr	6.0	0.22	5,010	7	5,003	100	98	98%	4,903	817	32	95%	4,626	7,847	84,582		
26-Apr	6.0	0.22	3,855	20	3,835	100	96	96%	3,682	614	9	95%	3,489	0	88,070		
26-Apr	6.0	0.22	5,024	59	4,965	100	99	99%	4,915	819	12	100%	4,903	8,392	92,974	7	16,239
28-Apr	6.0	0.22	3,831	19	3,812	100	99	99%	3,774	629	14	90%	3,382	0	96,356		
28-Apr	6.0	0.22	4,667	52	4,615	100	95	95%	4,384	731	12	95%	4,153	7,536	100,509		
29-Apr	6.0	0.22	4,790	33	4,757	100	97	97%	4,614	769	14	85%	3,908	7,912	108,421		BEGIN TAG CO
29-Apr	6.0	0.22	4,325	19	4,306	100	98	98%	4,220	703	5	95%	4,004	0	104,513		
30-Apr	6.0	0.22	3,704	19	3,685	100	99	99%	3,648	608	46	95%	3,420	0	111,841		
30-Apr	6.0	0.22	4,139	31	4,108	100	98	98%	4,026	671	52	95%	3,773	7,192	115,613		
01-May	6.0	0.22	4,009	49	3,960	100	99	99%	3,920	653	32	95%	3,692	0	119,306		
01-May	6.0	0.22	4,865	96	4,769	100	99	99%	4,721	787	22	95%	4,463	8,156	123,769	8	30,795
02-May	5.0	0.22	3,732	76	3,656	100	97	97%	3,546	709	12	95%	3,357	0	127,126		

4:11 PM  
Peltz (2)

Table 1. Numbers of HLCWT tagged and untagged pink salmon fry released from 3 Prince William Sound pink salmon hatcheries in 1986.

Tag Code Facility	A Can Cr	B Can Cr	A Esther	B Esther	A A.F.K.	B A.F.K.
Unmarked Fry	19,536,042	33,385,800	23,491,205	11,164,795	77,467,000	35,510,000
Marked Fry	100,509	109,653	154,065	57,021	155,303	48,235
Unmarked:Marked Ratio For All Release Groups	194:1	304:1	152:1	196:1	499:1	736:1
Largest UM:M Ratio For a Release Group	257:1	781:1	193:1	196:1	640:1	898:1
Smallest UM:M Ratio For a Release Group	106:1	168:1	134:1	196:1	409:1	537:1

- would like these to be much closer to produce good results.

Table 2. Percent tag retention, percent valid adipose fin clips, percent valid marks, and rates of tag application from 3 Prince William Sound pink salmon hatcheries in 1986.

Relt(3)

Facility	Can Cr	Esther	A.F.K.
Overnight Retention	95.3%	97.6%	97.5%
Short Term Retention	96.6%	97.1%	91.7%
% Valid Clips	93.3%	92.2%	91.8%
% Valid Marks	88.9%	89.9%	89.5%
Valid Tags / Hr	643	622	415
Workers/Shift	3	3	2
Valid Tags/Man-Hr	214	207	208



Table 4. Summary of tag recovery information for broodstock returns to 3 Prince William Sound Hatcheries in 1987.

Hatchery	Cannery Creek	Armin F. Koernig	Esther
*****	*****	*****	*****
Number of Fish Used for Broodstock	136231	202914	242957
No. of Fish Examined for Missing Adipose Fins	108577	100438	69286
No. of Fish with a Missing Adipose Fin	333	286	460
Valid Tag Recoveries	140	204	372
Percent Valid Tag Recoveries	42.0%	71.3%	80.9%
Tag Code A Recoveries	51	189	313
Tag Code B Recoveries	89	14	58

① Feel there was high mortality due to holding fish in 0.5°C water (raceways) before release

⑤ Tag placement may have resulted in higher tag losses in returning fish.

4/1/05  
Petter (S)

Table 3. Summary of Prince William Sound commercial tag recovery information from 3 pink salmon hatcheries in 1987.

District	No. With Number of Fish Sampled Examined	Adipose Fin	Missing Valid Tag Recoveries	Cannery Creek Recoveries Tag Code A	Cannery Creek Recoveries Tag Code B	Armin F. Koernig Recoveries Tag Code A	Armin F. Koernig Recoveries Tag Code B	Esther Recoveries Tag Code A	Esther Recoveries Tag Code B
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
EASTERN	323458	97	19	1	1	2	4	0	9
NORTHERN	214970	348	199	37	71	0	2	15	74
COGHILL	79565	51	27	1	6	0	1	4	15
NORTHWEST	44203	37	28	0	2	0	8	6	12
SOUTHWEST	1137357	2036	1601	24	37	103	738	153	546
MONTAGUE	18715	15	9	2	2	1	2	1	1
SOUTHEAST	132581	63	2	0	0	1	1	0	0
OTHER 1/	789585	980	623	35	49	40	157	132	210
TOTALS	2740434	3627	2508	100	168	147	913	311	867

1/ Includes all samples of fish from more than one district and samples from hatchery sales.

2/19/88  
Peltz (6)

Table 5. Comparison of unmarked:marked ratios at release in 1986 versus ratios at return in 1987 for pink salmon at 3 Prince William Sound Hatcheries.

	Hatchery					
	Cannery Creek		Cannery Creek		Armin F. Koernig	
	Tag Code A	Tag Code B	Tag Code A	Tag Code B	Tag Code A	Tag Code B
*****	*****					
Unmarked:Marked Ratio at Release	194:1	304:1	499:1	736:1	152:1	196:1
Unmarked:Marked Ratio in Broodstock	570:1	893:1	479:1	705:1	180:1	230:1
Percent of Mark Loss or Gain	- 293.8%	- 293.8%	+ 4.0%	+ 4.0%	- 18.4%	- 18.4%

problem

acceptable statistically, not expected

expected

DISTRICT 221 EASTERN  
DISTRICT

STAT EK	CATCH TOTAL	CWT PLANT TOTALS	PROCESSR TOTALS	% CWT PLANTS	% OTHER PLANTS	% FLOATING PROCESSR
26	1103179	868830	1103179	78.8%	21.2%	0.0%
27	2069933	1589702	2069933	76.8%	23.2%	0.0%
28	1243059	1018554	1243059	81.9%	18.0%	0.0%
29	498524	422758	498524	84.8%	15.2%	0.0%
30	408673	339083	452295	75.0%	25.0%	0.0%
31	516131	409929	470314	87.2%	6.5%	6.3%
32						
33	773830	514676	772471	66.6%	13.3%	20.1%
34	288132	205845	288094	71.5%	21.6%	6.9%
35	58275	38044	58040	65.5%	22.8%	11.7%
36	4795	2565	4795	53.5%	46.5%	0.0%
37	18	0	18	0.0%	100.0%	0.0%
TOTAL	6964549	5409986	6960722	77.7%	19.2%	3.0%

DISTRICT 222 NORTHERN  
DISTRICT

STAT WEEK	CATCH TOTAL	CWT PLANT TOTALS	PROCESSR TOTALS	% CWT PLANTS	% OTHER PLANTS	% FLOATING PROCESSR
26						
27	135362	117108	135362	86.5%	13.5%	0.0%
28	73077	54895	73077	75.1%	17.0%	7.9%
29	201457	174705	199517	87.6%	12.4%	0.0%
30	183588	158455	183588	86.3%	13.7%	0.0%
31	360500	182926	359889	50.8%	49.2%	0.0%
32	308872	199276	308872	64.5%	25.1%	10.4%
33	425483	246225	425483	57.9%	41.2%	0.9%
34	579070	411043	579070	71.0%	28.5%	0.5%
35	146392	23881	146392	16.3%	83.7%	0.0%
36	939	939	939	100.0%	0.0%	0.0%
37						
TOTAL	2414740	1569453	2412189	65.1%	33.1%	1.9%

DISTRICT 223 COGHILL  
DISTRICT

STAT WEEK	CATCH TOTAL	CWT PLANT TOTALS	PROCESSR TOTALS	% CWT PLANTS	% OTHER PLANTS	% FLOATING PROCESSR
25		608	608	100.0%	0.0%	0.0%
26	6432	2080	2080	100.0%	0.0%	0.0%
27	14154	3318	3318	100.0%	0.0%	0.0%
28	23075	12197	13741	88.8%	11.2%	0.0%
29	381403	172578	269014	64.2%	34.3%	1.5%
30	159327	49664	77930	63.7%	36.3%	0.0%
31	156946	48881	75244	65.0%	35.0%	0.0%
32	221520	63477	177264	35.8%	33.9%	30.3%
33	306222	152471	261203	58.4%	41.6%	0.0%
34	221768	96496	157889	61.1%	38.9%	0.0%
35	34388	1316	10561	12.5%	32.3%	55.2%
36	46250	39757	40506	98.2%	1.8%	0.0%
37	4904	0	0			
TOTAL	1576389	642235	1089358	59.0%	35.1%	5.8%

## DISTRICT 224 NORTHWESTERN

3  
Peltz

STAT WEEK	DISTRICT CATCH TOTAL	CWT PLANT TOTALS	PROCESSR TOTALS	% CWT PLANTS	% OTHER PLANTS	% FLOATING PROCESSR
26			0			
27			0			
28			0			
29	149319	111203	149319	74.5%	25.5%	0.0%
30	128221	91518	128221	71.4%	28.6%	0.0%
31	149490	103678	149490	69.4%	25.1%	5.5%
32	145889	73120	145889	50.1%	49.9%	0.0%
33	64533	8569	64533	13.3%	86.7%	0.0%
34	37960	9361	37960	24.7%	75.3%	0.0%
35	63563	24040	63563	37.8%	62.2%	0.0%
36	11902	11902	11902	100.0%	0.0%	0.0%
37			0			
TOTAL	750877	433391	750877	57.7%	41.2%	1.1%

## DISTRICT 226 SOUTHWESTERN

STAT WEEK	DISTRICT CATCH TOTAL	CWT PLANT TOTALS	PROCESSR TOTALS	% CWT PLANTS	% OTHER PLANTS	% FLOATING PROCESSR
26			0			
27			0			
28			0			
29			0			
30	729724	615220	728174	84.5%	9.9%	5.6%
31	1290800	798137	1284848	62.1%	9.7%	28.2%
32	3270861	2047834	3266602	62.7%	13.2%	24.2%
33	3885502	2468673	3877066	63.7%	11.1%	25.3%
34	2748034	1628099	2709321	60.1%	8.4%	31.5%
35	1092250	488419	1092250	44.7%	5.5%	49.8%
36	316410	122446	316410	38.7%	11.2%	50.1%
37	8359	0	8359	0.0%	46.8%	53.2%
TOTAL	13341940	8168828	13283030	61.5%	10.4%	28.1%

[ problem - not measured

Pet 2

DISTRICT 227 MONTAGUE

STAT WEEK	DISTRICT CATCH TOTAL	CWT PLANT TOTALS	PROCESSR TOTALS	% CWT PLANTS	% OTHER PLANTS	% FLOATING PROCESSR
26			0			
27			0			
28			0			
29			0			
30	64866	28353	64866	43.7%	3.8%	52.5%
31	1442	1442	1442	100.0%	0.0%	0.0%
32	2493	0	2493	0.0%	0.0%	100.0%
33	39926	0	39926	0.0%	0.0%	100.0%
34	2284	2284	2284	100.0%	0.0%	0.0%
35			0			
36			0			
37			0			
TOTAL	111011	32079	111011	28.9%	2.2%	68.9%

DISTRICT 228 SOUTHEAST

STAT WEEK	DISTRICT CATCH TOTAL	CWT PLANT TOTALS	PROCESSR TOTALS	% CWT PLANTS	% OTHER PLANTS	% FLOATING PROCESSR
26			0			
27			0			
28			0			
29	154218	121552	154218	78.8%	5.6%	15.6%
30	374987	329362	361779	91.0%	7.2%	1.8%
31	356391	332903	353699	94.1%	5.5%	0.4%
32			0			
33			0			
34	29834	29834	29834	100.0%	0.0%	0.0%
35	40558	40558	40558	100.0%	0.0%	0.0%
36			0			
37			0			
TOTAL	955988	854209	940088	90.9%	5.7%	3.4%

PHZ

# WS PINK SALMON CWT SUMMARY

FISHING DISTRICT	FISHING PERIOD	STAT WEEK	DISTRICT CATCH	FISH EXAMINED	PERCENT EXAMINED	NUMBER OF MISSING ADIPOSE	VALID TAG RECOVERIES	AFK CATCH	CC CATCH	ESTHER CATCH	TOTAL CATCH	PERCENT HATCHERY CONTRIB
Eastern District Pink Salmon Tag Recovery Program												
221 June 22-26	26	1103179	1211	0.1%				0	0	0	0	0.0%
221 June 29-July 3	27	2069933										
221 July 8-9	28	1243059	27138	2.2%	4	0	0	0	0	0	0	0.0%
221 July 14-16	29	498524	80609	16.2%	22	0	0	0	0	0	0	0.0%
221 July 21-23	30	408673	22592	5.5%	6	0	0	0	0	0	0	0.0%
221 July 28-30	31	516131	62069	12.1%	19	2	0	4669	1896	6565	1.3%	
221	32											
221 August 10-14	33	773830	77824	10.1%	20	6	9526	8879	5369	23774	3.1%	
221 August 17-21	34	288132	45156	15.7%	26	11	15110	3637	6891	25638	8.9%	
221 August 24-28	35	58275	7530	12.9%	0	0	0	0	0	0	0.0%	
221 Aug 31-Sept 4	36	4795		0.0%							0.0%	
SEASON TOTAL		6964531	324129	4.7%	97	19	24636	17185	14156	55977	0.8%	

## Northern District Pink Salmon Tag Recovery Program

June 29-July 3	27	135362										
222 July 8-9	28	73077	1046	1.4%								
222 July 14-16	29	201457	30818	15.3%	11	1	0	3726	0	3726	1.8%	
222 July 21-23	30	183588	32500	17.7%	14	6	0	17924	1017	18941	10.3%	
222 July 28-30	31	360500	30152	8.4%	67	34	0	256470	12913	269383	74.7%	
222 Aug 4-7	32	308872	26564	8.6%	68	33	5570	232410	12558	250537	81.1%	
222 August 10-14	33	425483	46682	11.0%	74	56	0	91090	73736	164827	38.7%	
222 August 17-21	34	579070	47209	8.2%	115	69	5875	359605	77767	443248	76.5%	
222 August 24-28	35	146392		0.0%			0	100000	0	100000	68.3%	
SEASON TOTAL		2413801	214971	8.9%	349	199	11445	1061225	177990	1250660	51.8%	

## Coghill District Pink Salmon Tag Recovery Program

223 Jun 15-Jul 16	26 t	451467	32131	7.1%	8	0	0	0	0	0	0.0%	
223 July 21-23	30	159327	20666	13.7%	6	0	0	0	0	0	0.0%	
223 July 28-30	31	156946	9589	5.9%	7	5	0	0	14731	14731	9.4%	
223/224 Aug 4-7 Cog/Nw	32	367409	27354	5.9%	71	53	12868	126580	101677	241125	65.6%	
223/224 August 10-14	33	370755	13808	3.7%	31	28	0	71933	126198	198132	53.4%	
223 August 17-21	34	221768					0	35000	100000	135000	60.9%	
223 August 24-28	35	34388					0	0	25000	25000	72.7%	
223 Aug 31-Sept 4	36	46250					0	0	40000	40000	86.5%	
SEASON TOTAL		1808310	103548	5.7%	123	86	12868	233513	407607	653987	36.2%	

Cannery Ck fish

Esther  
AFK  
Cannery Ck

## Northwest District Pink Salmon Tag Recovery Program

224 July 14-16	29	146717	5291	3.6%	2	0	0	0	0	0	0.0%
224 July 21-23	30	128221	8004	6.2%	2	1	0	0	2884	2884	2.2%
224 July 28-30	31	149490	22167	14.8%	14	9	16151	0	5193	21344	14.3%
23/224 Aug 4-7	32										
23/224 August 10-14	33										
224 August 17-21	34	37960					0	0	20000	20000	52.7%
224 August 24-28	35	63563					0	0	30000	30000	47.2%
224 Aug 31-Sept 4	36	11902					0	0	0	0	0.0%
SEASON TOTAL		537853	35462	6.6%	18	10	16151	0	58077	74228	13.8%

## SW District Pink Salmon Tag Recovery Program

226 July 21-23	30	729724	48920	6.7%	24	14	67677	0	14917	82594	11.3%
226 July 28-30	31	1290800	127433	9.9%	243	176	558763	99381	117321	775465	60.1%
226 Aug 4-7	32	3270861	336927	10.3%	618	465	1404145	157460	467123	2028728	62.0%
226 August 10-14	33	3885502	297867	7.7%	591	474	1861858	109194	595476	2566528	66.1%
226 August 17-21	34	2748034	252887	9.2%	429	357	1059399	97226	390851	1547476	56.3%
226 August 24-28	35	1092250	73323	6.7%	131	115	688797	6591	185545	880933	80.7%
226 Aug 31-Sept 4	36	316410					270000	0	0	270000	85.3%
SEASON TOTAL		13333581	1137357	8.5%	2036	1601	5910639	469852	1771233	8151724	61.1%

Most AFIC  
Many Ester  
Fewer Canney CK (Small)

## Montague District Pink Salmon Tag Recovery Program

— NOT CONSIDERED —

## Southeast District Pink Salmon Tag Recovery Program

228 July 14-16	29	154218	10218	6.6%	3	0	0	0	0	0	0.0%
228 July 21-23	30	374987	64489	17.2%	26	0	0	0	0	0	0.0%
228 July 28-30	31	356391	55023	16.9%	33	1	3103	0	0	3103	0.9%
228											
228 August 10-14	33										
228 August 17-21	34	29834	2851	9.6%	1	1	7377	0	0	7377	24.7%
228 August 24-28	35	40558					0	0	0	0	0.0%
SEASON TOTAL		955988	132581	13.9%	63	2	10480	0	0	10480	1.1%

GRAND TOTAL 26014064 1948048 7.5% 2686 1917 5986219 1781775 2429062 10197056 39.2%

a) PNP didn't feel that there were large #'s of wild stocks present in SW district after Aug 10



		PERCENT	<i>Canary</i> OK CC	PERCENT		PERCENT	TOTAL	PERCENT
DISTRICT	AFK CATCH	CATCH BY DISTRICT	CATCH	CATCH BY DISTRICT	ESTHER CATCH	CATCH BY DISTRICT	HATCHERY CATCH	CATCH BY DISTRICT
*****								
EASTERN	24636	0.4%	17185	1.0%	14156	0.6%	55977	0.5%
NORTHERN	11445	0.2%	1061225	59.6%	177990	7.3%	1250660	12.3%
COGHILL	12868	0.2%	233513	13.1%	407607	16.8%	653987	6.4%
NORTHWEST	16151	0.3%	0	0.0%	58077	2.4%	74228	0.7%
SOUTHWEST	5910639	98.7%	469852	26.4%	1771233	72.9%	8151724	79.9%
SOUTHEAST	10480	0.2%	0	0.0%	0	0.0%	10480	0.1%
-----								
TOTAL	5986219		1781775		2429062		10197056	
TOTAL HATCHERY RETURN	7658858		2122816		3035009			
TOTAL INTERCEPTION	78.2%		83.9%		80.0%			

## PRINCE WILLIAM SOUND PINK SALMON HATCHERY SUMMARY

	Comm. Catch	Hatch Sales	Escape	Total	Percent Interception	Fry Release	Marine Survival	Comments
*****								
AFK	5986218	1282640	390000	7658858	78.2%	112977000	6.8%	4.0% on late release 8.1% on early release
Ester	2429063	305946	300000	3035009	80.0%	34656000	8.8%	6.5% on late release 9.8% on early release
Cannery	1781814	41002	300000	2122816	83.9%	52921842	4.0%	2.9% on early release 4.7% on late release
VFDA	3500000	1356473	300000	5156473	67.9%	54670000	9.4%	
Total Hatchery Catch	13697095		Total PWS Catch	26125769			Percent Hatchery Contribution	52.4%
Total Hatchery Catch	13697095		Total Hatchery Return	17973156			Interception Rate For Hatcheries	76.2%
Total Wild Stock Catch	12428674		Assumed Wild Stock Interception	80.0%			Assumed Wild Stock Escapement	3107168

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